<ART-0740>

SERVICE MANUAL

STEREO PRE-AMPLIFIER

EXCLUSIVE C3

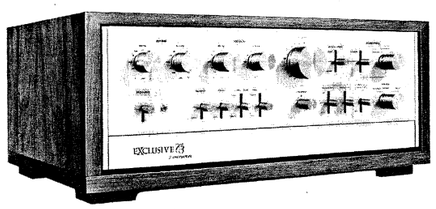
N

<74J00Y71D>

PIONEER®

CONTENTS

1. SPECIFICATIONS 4
2. FRONT PANEL FACILITIES 6
3. CONNECTION DIAGRAM 9
4. BLOCK DIAGRAM 11
5. CIRCUIT DESCRIPTION 13
6. LEVEL DIAGRAM 15
7. DISASSEMBLY 16
8. PARTS AND P.C. BOARD LOCATIONS 17
9. ALIGNMENT PROCEDURE 19
10. PACKING METHOD AND PART NUMBERS 20
11. EXPLODED VIEW AND PARTS LISTS 21
12. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LISTS
    - 12.1 Circuit Connection Diagram and Miscellaneous Parts 25
    - 12.2 Equalizer Amplifier Assembly (AWF-012-A) 33
    - 12.3 Flat Amplifier-A Assembly (AWG-026-B) 36
    - 12.4 Flat Amplifier-B Assembly (AWG-028-0) 40
    - 12.5 Buffer Amplifier Assembly (AWM-052-0) 44
    - 12.6 Filter Amplifier Assembly (AWM-053-A) 47
    - 12.7 Muting-Buffer Amplifier Assembly (AWM-054-B) 51
    - 12.8 Headphone Amplifier Assembly (AWN-055-0) 55
    - 12.9 Power Supply Circuit Assembly (AWR-048-0) 59
    - 12.10 Switch Circuit-1 Assembly (AWS-055-0) 63
    - 12.11 Switch Circuit-2 Assembly (AWS-056-0) 65
    - 12.12 Switch Circuit-3 Assembly (AWS-057-B) 67
    - 12.13 Switch Circuit-4 Assembly (AWS-058-0) 70
    - 12.14 Switch Circuit-5 Assembly (AWS-059-0) 71



1. SPECIFICATIONS

SEMICONDUCTORS

Transistors	64
Diodes	36

PRE-AMPLIFIER SECTION

Circuitry Type	
Equalizer Amplifier	3-stage direct-coupled class-A SEPP type with 1st stage differential amplifier.
Flat Amplifier	3-stage direct-coupled type with 1st stage differential amplifier.
Input Terminal (Sensitivity/Impedance)	PHONO 1 : 2.5mV/50kΩ PHONO 2 : 2.5mV to 10mV/25kΩ, 50kΩ, 100kΩ (switchable) PHONO 3 : 2.5mV/50kΩ TUNER : 150mV/100kΩ AUX 1 : 150mV/100kΩ AUX 2 : 150mV/100kΩ AUX 3 : 150mV to ∞/100kΩ TAPE PB 1, 2, 3 : 150mV/100kΩ
PHONO Overload Level (T.H.D. : 0.05%)	PHONO 1, 3 : 700mV (rms)/1.97V(p-p) at 1kHz. PHONO 2 : 700mV (rms) to 1.4V (rms)/1.97V(p-p) to 3.95V(p-p) at 1kHz.
Output Terminals (Level/Impedance)	TAPE REC 1, 2, 3 : 150mV/2.5kΩ OUTPUT A, B (R_L: 50kΩ) : 2V/600Ω (rated), 15V/600Ω (max.) HEADPHONES (R_L: 8Ω) : 170mV/40Ω (OUTPUT, 100mV), 500mV/40Ω (max.)
Total Harmonic Distortion (20Hz to 20kHz)	Less than 0.03% (OUTPUT, 2V) Less than 0.05% (OUTPUT, 15V)
Frequency Response	
PHONO RIAA Equalization	30Hz to 15kHz ±0.2dB
TUNER, AUX, TAPE PB	20Hz to 20kHz $^{+0}_{-0.5}$ dB, 10Hz to 90kHz $^{+0}_{-1}$ dB
Tone Control	
BASS	MAIN: ±7.5dB (100Hz) with 1.5dB step SUB: ±6dB (50Hz) with 1.5dB step
TREBLE	MAIN: ±7.5dB (10kHz) with 1.5dB step SUB: ±6dB (20kHz) with 1.5dB step
Filters	
Low-Cut Filter	15Hz (12dB/oct.), 30Hz (18dB/oct.)
High-Cut Filter	12kHz (12dB/oct.), 8kHz (18dB/oct.)
Signal-to-Noise Ratio (IHF, short-circuited, A network)	PHONO: More than 70dB TUNER, AUX, TAPE PB: More than 90dB
Attenuator	-15dB, -30dB

MISCELLANEOUS

Power Requirements	
Power Consumption	
AC Outlets	
Dimensions	
Weight: Without package	
With package	

FURNISHED PARTS

Hex. Wrench (Used for fastening VOLUME knob)	
Technical data sheets	
Operating Instructions	

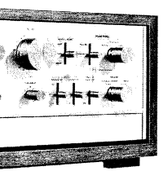
NOTE:
Specifications and the design subject to

TS

. 4
. 6
. 9
. 11
. 13
. 15
. 16
. 17
. 19
. 20
. 21

TERNS AND PARTS LISTS

laneous Parts 25
012-A) 33
6-B) 36
3-0) 40
-0) 44
A) 47
WM-054-B) 51
-055-0) 55
048-0) 59
0) 63
0) 65
3) 67
0) 70
0) 71



1. SPECIFICATIONS

SEMICONDUCTORS

Transistors	64
Diodes	36

PRE-AMPLIFIER SECTION

Circuitry Type	
Equalizer Amplifier	3-stage direct-coupled class-A SEPP type with 1st stage differential amplifier.
Flat Amplifier	3-stage direct-coupled type with 1st stage differential amplifier.
Input Terminal (Sensitivity/Impedance)	PHONO 1 : 2.5mV/50kΩ PHONO 2 : 2.5mV to 10mV/25kΩ, 50kΩ, 100kΩ (switchable) PHONO 3 : 2.5mV/50kΩ TUNER : 150mV/100kΩ AUX 1 : 150mV/100kΩ AUX 2 : 150mV/100kΩ AUX 3 : 150mV to ∞/100kΩ TAPE PB 1, 2, 3 : 150mV/100kΩ
PHONO Overload Level (T.H.D. : 0.05%)	PHONO 1, 3 : 700mV (rms)/1.97V(p-p) at 1kHz. PHONO 2 : 700mV (rms) to 1.4V (rms)/1.97V(p-p) to 3.95V(p-p) at 1kHz.
Output Terminals (Level/Impedance)	TAPE REC 1, 2, 3 : 150mV/2.5kΩ OUTPUT A, B (R_L: 50kΩ) : 2V/600Ω (rated), 15V/600Ω (max.) HEADPHONES (R_L: 8Ω) : 170mV/40Ω (OUTPUT, 100mV), 500mV/40Ω (max.)
Total Harmonic Distortion (20Hz to 20kHz)	Less than 0.03% (OUTPUT, 2V) Less than 0.05% (OUTPUT, 15V)
Frequency Response	
PHONO RIAA Equalization	30Hz to 15kHz ±0.2dB
TUNER, AUX, TAPE PB	20Hz to 20kHz $^{+0}_{-0.5}$ dB, 10Hz to 90kHz $^{+0}_{-1}$ dB
Tone Control	
BASS	MAIN: ±7.5dB (100Hz) with 1.5dB step SUB: ±6dB (50Hz) with 1.5dB step
TREBLE	MAIN: ±7.5dB (10kHz) with 1.5dB step SUB: ±6dB (20kHz) with 1.5dB step
Filters	
Low-Cut Filter	15Hz (12dB/oct.), 30Hz (18dB/oct.)
High-Cut Filter	12kHz (12dB/oct.), 8kHz (18dB/oct.)
Signal-to-Noise Ratio (IHF, short-circuited, A network)	PHONO: More than 70dB TUNER, AUX, TAPE PB: More than 90dB
Attenuator	-15dB, -30dB

MISCELLANEOUS

Power Requirements	AC 220V, 50Hz
Power Consumption	28W
AC Outlets	Switched; 3, Unswitched; 3
Dimensions	468(W) x 206(H) x 342(D) mm 18-7/16 x 8-1/8 x 13-15/32 in.
Weight: Without package	12.5kg (27 lb 8 oz)
With package	16.9kg (37 lb 3 oz)

FURNISHED PARTS

Hex. Wrench (Used for fastening VOLUME knob)	1
Technical data sheets	1
Operating Instructions	1

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.

he adjustment of the low
main control and the 50Hz

uencies below 400Hz with
t 700Hz; adjustment range
1.5dB click stops.
sts low frequencies below
full effect at 50Hz; adjust-
6dB with 1.5dB click stops.

uplicating) from one tape to
tape when using two tape
1 and TAPE 2 terminals.
from tape deck 1 to tape

ing.
from tape deck 2 to tape

eck, the condition of the
t has been dubbed can be
MONITOR switch is set
If it is set to SOURCE,
cted with the FUNCTION
e page 11.

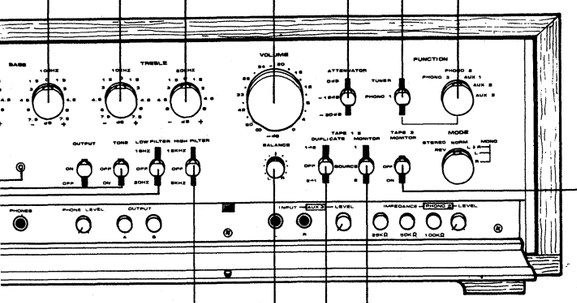
TWIN TREBLE CONTROLS

There are two controls for the adjustment of the high frequency response, the 10kHz main control and the 20kHz sub-control.

10kHz (main) . . Adjusts frequencies above 2.5kHz with full effect at 10kHz; adjustment range ±7.5dB with 1.5dB click stops.

20kHz (sub) . . . Further adjusts high frequencies above 5kHz with full effect at 20kHz; adjustment range ±6dB with 1.5dB click stops.

NOTE:
Flat frequency response can be obtained in two ways: by setting all tone controls to "0" or by setting the TONE switch to OFF.



TAPE 1, 2 MONITOR SWITCH

This is used for playing back tape decks connected to the TAPE 1 and 2 terminals and for monitoring recordings being made on these tape decks.

1 . . . . . To play back or monitor a recording being made on a tape deck connected to the TAPE 1 terminals.

SOURCE . . . When not playing back or monitoring tape decks connected to the TAPE 1 and 2 terminals.

2 . . . . . To play back or monitor a recording being made on a tape deck connected to TAPE 2 terminals.

VOLUME CONTROL

This adjusts the output levels of the OUTPUT and PHONES terminals. Turn clockwise to increase the level. Maximum level is the 0dB position. The graduated click positions indicate the attenuation below 0dB. If this control is used in combination with the ATTENUATOR switch, an extremely wide and flexible control over output level is possible. For details, refer to "VOLUME CONTROL AND ATTENUATOR SWITCH" on page 12.

ATTENUATOR SWITCH

This switch attenuates the output level by the amounts indicated.

0dB . . . . . no attenuation
–15dB . . . . 15dB attenuation
–30dB . . . . 30dB attenuation

FUNCTION SWITCHES

These two switches are used to select the program source.

Lever Switch

TUNER . . . . To receive broadcasts from a tuner connected to the TUNER terminals.

PHONO 1 . . To play a record on the turntable connected to the PHONO 1 terminals.

Rotary Switch

When the lever switch is in its bottom position, the program source is selected with this switch.

PHONO 2 . . Playing a turntable connected to the PHONO 2 terminals.

PHONO 3 . . Playing a turntable connected to the PHONO 3 terminals.

AUX 1 . . . . Playing a source connected to the AUX 1 terminals.

AUX 2 . . . . Playing a source connected to the AUX 2 terminals.

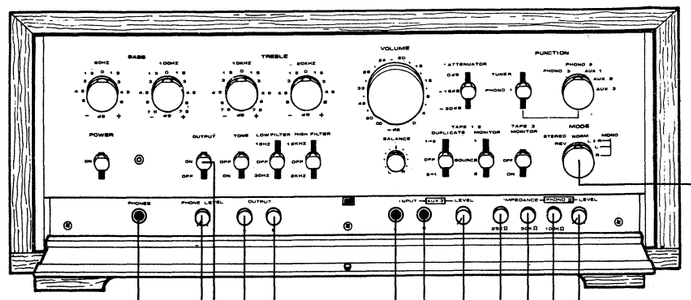
AUX 3 . . . . Playing a source connected to the AUX 3 terminals.

TAPE 3 MONITOR SWITCH

Switch this ON to play back or monitor the tape deck connected to the TAPE 3 terminals.

Opening and Closing the Sub-panel

Push the middle of the sub-panel lightly, and it will open slightly. Now, to open it completely, put your finger in the opening and pull it down. To shut the panel, push it back up.



PHONES JACK

Plug in stereo headphones.

PHONE LEVEL CONTROL

Adjusts the output level of the PHONES jack.

OUTPUT ON-OFF SWITCH

This switches on and off the signal going to the OUTPUT terminals. It has no effect on the headphone output. Use it to eliminate noise when you are changing records and tapes.

OUTPUT BUTTONS A, B

Used to change the OUTPUT terminals at which signals are present. When both switches, A and B, are in, the signals will be present at both pairs of terminals.

AUX 3 INPUT TERMINALS (L, R)

Used in place of the rear panel AUX 3 terminals for the connection of stereo components such as an 8-track cartridge deck with phone type plugs. Be careful to connect Left to L and Right to R. When these are used, the source connected to the rear panel AUX 3 terminals cannot be heard.

AUX 3 LEVEL CONTROL

Adjusts the input level of the source connected to the AUX 3 terminals. No sound will be produced when it is turned fully counterclockwise.

PHONO 2 IMPEDANCE BUTTONS

The input impedance of the PHONO 2 terminals can be changed to match cartridges with impedances of 25kΩ, 50kΩ and 100kΩ by pressing one of these three push-button switches.

PHONO 2 LEVEL CONTROL

This adjusts the sensitivity of the PHONO 2 terminals. Turning from fully clockwise to fully counterclockwise reduces the input sensitivity by 12dB to match cartridges with a higher output level.

MODE SWITCH

STEREO REV . . . Stereo playback with the channels reversed; the left channel is heard from the right speaker and the right channel is heard from the left speaker.

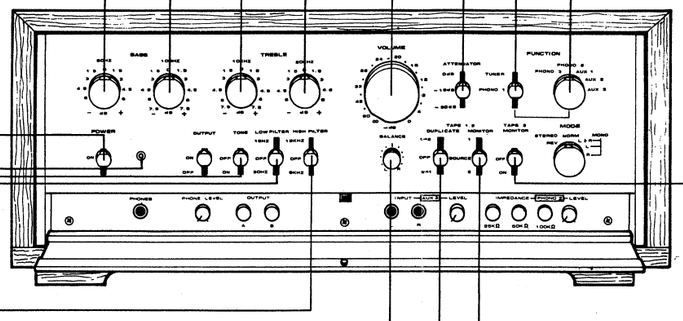
STEREO NORM . . For normal stereo playback.

MONO L & R . . . . For mono sound; the left channel plus the right channel is heard from both speakers.

MONO L . . . . . For mono sound; the left channel is heard from both speakers.

MONO R . . . . . For mono sound; the right channel is heard from both speakers.

2. FRONT PANEL FACILITIES



POWER SWITCH

Flip up to turn the power ON. No signal will be produced for several seconds because the muting circuit is activated. It is NOT due to a malfunction.

PILOT LAMP

This lights when the power is switched ON.

TONE SWITCH

This is a defeat switch. When it is OFF, the tone control circuit is by-passed and the frequency response is flat. Use it when measuring the frequency response of phono cartridges and speaker systems, when investigating the acoustic characteristics of a room or when you want to hear the effect that the tone controls give.

LOW FILTER SWITCH

Switches on low cut filters which eliminate low frequency noise, motor rumble, etc.

15Hz . . . . Frequencies below 15Hz are attenuated by 12dB/oct
OFF . . . . No filtering of low frequency sound.
30Hz . . . . Frequencies below 30Hz are attenuated by 18dB/oct.

HIGH FILTER SWITCH

Switches on high cut filters which eliminate high frequency noise, tape hiss, etc.

12kHz . . . Frequencies above 12kHz are attenuated by 12dB/oct.
OFF . . . . No filtering of high frequency sound.
8kHz . . . . Frequencies above 8kHz are attenuated by 18dB/oct.

NOTE:
A detailed explanation of the filters is given on page 12.

BALANCE CONTROL

This adjusts the balance between the right and left speaker systems. When it is in the center position (▼), the level from the two speakers is the same. Boost the right speaker volume by turning clockwise, and the left speaker volume by turning counterclockwise.

The balance control used in the EXCLUSIVE C3 is of a new type. You can alter the left-right balance without changing the volume.

TWIN BASS CONTROLS

There are two controls for the adjustment of the low frequency response, the 100Hz main control and the 50Hz sub-control.

100Hz (main) . . Adjusts frequencies below 400Hz with full effect at 100Hz; adjustment range ±7.5dB with 1.5dB click stops.
50Hz (sub) . . . . Further adjusts low frequencies below 200Hz with full effect at 50Hz; adjustment range ±6dB with 1.5dB click stops.

TWIN TREBLE CONTROLS

There are two controls for the adjustment of the high frequency response, the 10kHz main control and the 20kHz sub-control.

10kHz (main) . . Adjusts frequencies above 2.5kHz with full effect at 10kHz; adjustment range ±7.5dB with 1.5dB click stops.
20kHz (sub) . . . Further adjusts high frequencies above 5kHz with full effect at 20kHz; adjustment range ±6dB with 1.5dB click stops.

NOTE:
Flat frequency response can be obtained in two ways: by setting all tone controls to "0" or by setting the TONE switch to OFF.

DUPLICATE SWITCH

This is used when dubbing (duplicating) from one tape to another or editing recorded tape when using two tape decks connected to the TAPE 1 and TAPE 2 terminals.

1→2 . . . . . When dubbing from tape deck 1 to tape deck 2.
OFF . . . . . When not dubbing.
2→1 . . . . . When dubbing from tape deck 2 to tape deck 1.

NOTE:
When using a 3-head tape deck, the condition of the recording immediately after it has been dubbed can be monitored if the TAPE 1, 2 MONITOR switch is set to the appropriate position. If it is set to SOURCE, you will hear the source selected with the FUNCTION switches from the speakers. See page 11.

TAPE 1, 2 MONITOR SWITCH

This is used for playing back tape decks connected to the TAPE 1 and 2 terminals and for monitoring recordings being made on these tape decks.

1 . . . . . To play back or monitor a recording being made on a tape deck connected to the TAPE 1 terminals.
SOURCE . . . When not playing back or monitoring tape decks connected to the TAPE 1 and 2 terminals.
2 . . . . . To play back or monitor a recording being made on a tape deck connected to TAPE 2 terminals.

VOLUME CONTROL

This adjusts the output levels of the OUTPUT and PHONES terminals. Turn clockwise to increase the level. Maximum level is the 0dB position. The graduated click positions indicate the attenuation below 0dB. If this control is used in combination with the ATTENUATOR switch, an extremely wide and flexible control over output level is possible. For details, refer to "VOLUME CONTROL AND ATTENUATOR SWITCH" on page 12.

ATTENUATOR SWITCH

This switch attenuates the output level by the amounts indicated.

0dB . . . . . no attenuation
–15dB . . . . 15dB attenuation
–30dB . . . . 30dB attenuation

FUNCTION SWITCHES

These two switches are used to select the program source.

Lever Switch

TUNER . . . . To receive broadcasts from a tuner connected to the TUNER terminals.
PHONO 1 . . To play a record on the turntable connected to the PHONO 1 terminals.

Rotary Switch

When the lever switch is in its bottom position, the program source is selected with this switch.

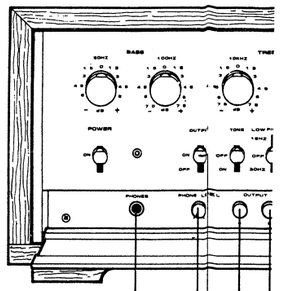
PHONO 2 . . Playing a turntable connected to the PHONO 2 terminals.
PHONO 3 . . Playing a turntable connected to the PHONO 3 terminals.
AUX 1 . . . . Playing a source connected to the AUX 1 terminals.
AUX 2 . . . . Playing a source connected to the AUX 2 terminals.
AUX 3 . . . . Playing a source connected to the AUX 3 terminals.

TAPE 3 MONITOR SWITCH

Switch this ON to play back or monitor the tape deck connected to the TAPE 3 terminals.

Opening and Closing the Sub-panel

Push the middle of the sub-panel lightly, and it will open slightly. Now, to open it completely, put your finger in the opening and pull it down. To shut the panel, push it back up.



PHONES JACK

Plug in stereo headphones.

PHONE LEVEL CONTROL

Adjusts the output level of the PHONES jack.

OUTPUT ON-OFF SWITCH

This switches on and off the signal going to the OU terminals. It has no effect on the headphone outp it to eliminate noise when you are changing reco tapes.

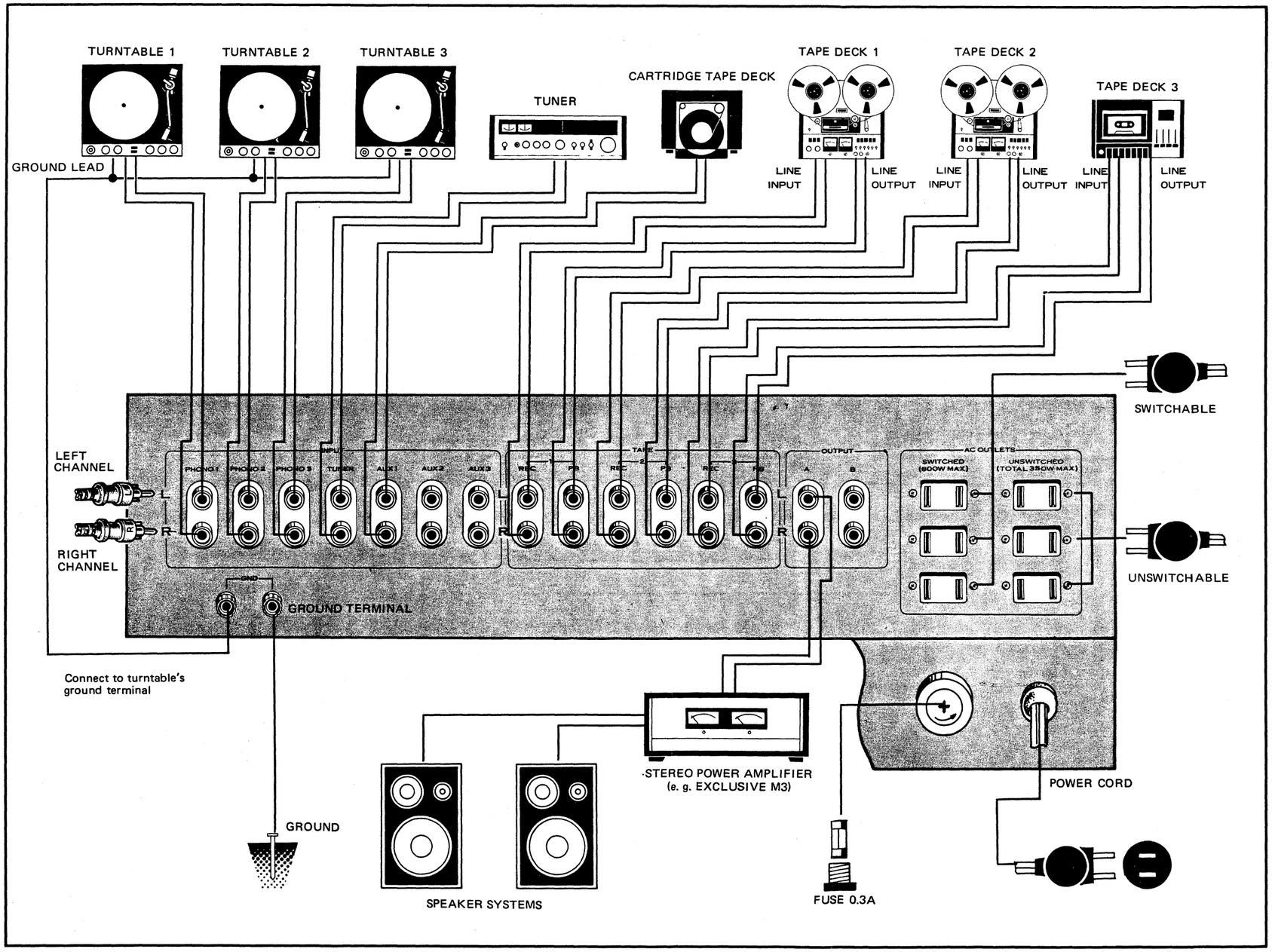
OUTPUT BUTTONS A, B

Used to change the OUTPUT terminals at which are present. When both switches, A and B, are signals will be present at both pairs of terminals.

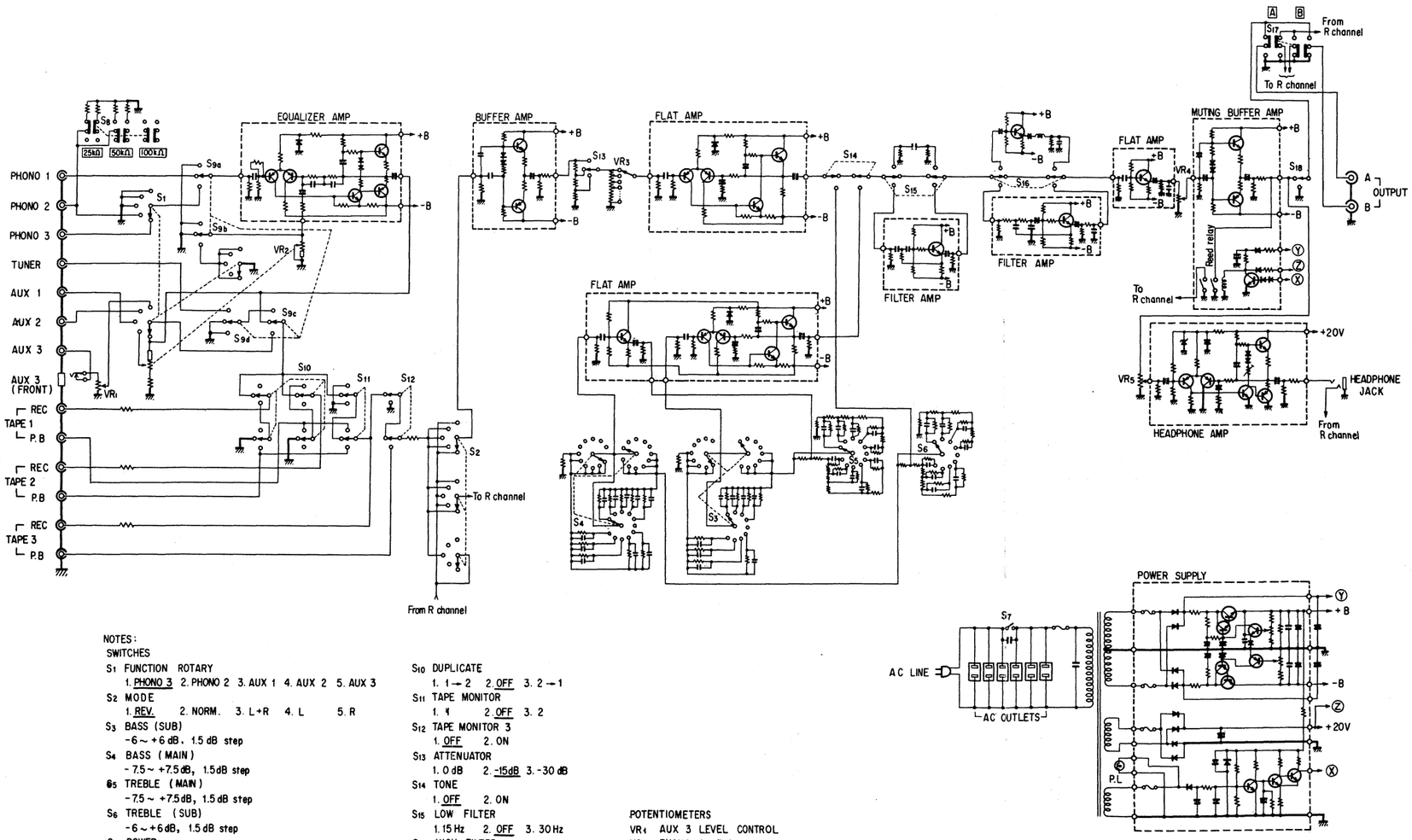
AUX 3 INPUT TERMINALS (L, R)

Used in place of the rear panel AUX 3 terminals connection of stereo components such as an cartridge deck with phone type plugs. Be careful nect Left to L and Right to R. When these are u source connected to the rear panel AUX 3 te cannot be heard.

3. CONNECTION DIAGRAM



4. BLOCK DIAGRAM



NOTES:

SWITCHES

- S_1 FUNCTION ROTARY
  1. PHONO 3 2. PHONO 2 3. AUX 1 4. AUX 2 5. AUX 3
- S_2 MODE
  1. REV. 2. NORM. 3. L+R 4. L 5. R
- S_3 BASS (SUB)
  -6 ~ +6 dB, 1.5 dB step
- S_4 BASS (MAIN)
  -7.5 ~ +7.5 dB, 1.5 dB step
- S_5 TREBLE (MAIN)
  -7.5 ~ +7.5 dB, 1.5 dB step
- S_6 TREBLE (SUB)
  -6 ~ +6 dB, 1.5 dB step
- S_7 POWER
  ON ⇌ OFF
- S_8 PHONO 2 INPUT IMPEDANCE
  1. 25 kΩ 2. 50 kΩ 3. 100 kΩ
- S_9 FUNCTION LEVER
  1. TUNER 2. PHONO 1 3. ROTARY
- S_{10} DUPLICATE
  1. 1 → 2 2. OFF 3. 2 → 1
- S_{11} TAPE MONITOR
  1. ↯ 2. OFF 3. 2
- S_{12} TAPE MONITOR 3
  1. OFF 2. ON
- S_{13} ATTENUATOR
  1. 0 dB 2. -15dB 3. -30 dB
- S_{14} TONE
  1. OFF 2. ON
- S_{15} LOW FILTER
  1. 15 Hz 2. OFF 3. 30 Hz
- S_{16} HIGH FILTER
  1. 12 kHz 2. OFF 3. 8 kHz
- S_{17} OUTPUT
  1. A 2. B
- S_{18} OUTPUT
  1. ON 2. OFF

POTENTIOMETERS

- VR_1 AUX 3 LEVEL CONTROL
- VR_2 PHONO 2 LEVEL CONTROL
- VR_3 VOLUME CONTROL
- VR_4 BALANCE CONTROL
- VR_5 HEADPHONE LEVEL CONTROL

5. CIRCUIT DESCRIPTION

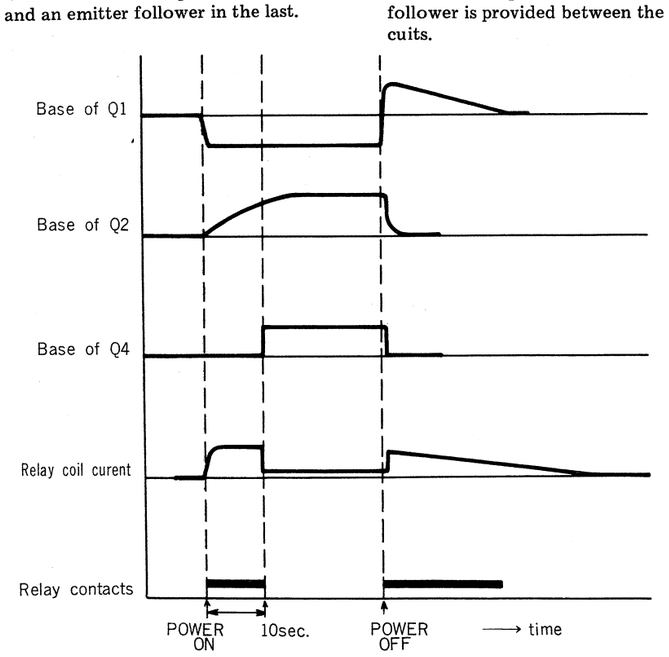
Only the left channel is described, referring to the Schematic diagram.

Signal Path

1. The signals from the various input terminals are selected by the FUNCTION switches.
2. Phono signals from the three pairs of PHONO INPUT terminals are equalized by the equalizer amplifier in accordance with the RIAA equalization curve.
   The equalizer amplifier has a differential amplifying circuit in its first stage and an SEPP circuit in its final stage, thus ensuring superior DC stability and high power efficiency. The signal from the PHONO 2 terminals is modified by the impedance selector switch and level control. The level control varies the overall NFB and controls the output level with the potentiometer.
3. After going through the TAPE DUPLICATE, TAPE MONITOR and MODE switches, the signals are fed to the buffer amplifier. The buffer amplifier is before the ATTENUATOR switch and VOLUME control so that other components which are connected are not affected by the setting of these controls.
4. After passing through the ATTENUATOR switch and VOLUME control, the signals are amplified by 25.5dB by a flat amplifier. This flat amplifier has good DC stability because it uses a differential amplifier in the first stage and an emitter follower in the last.
5. From the flat amplifier, the signals go to the TONE switch, LOW/HIGH FILTER switches and the filter buffer's emitter follower to the BALANCE control.
6. From the BALANCE control, the signals go to the complementary buffer amplifier and then to the OUTPUT terminals. The buffer amplifier keeps the output impedance low.
7. Part of the buffer amplifier's output is fed to the headphone amplifier through the HEADPHONE LEVEL control. The headphone amplifier is all-stage direct-coupled pure complementary circuit with a differential amplifier in the first stage.

Tone Control Circuit

When the TONE switch is set to OFF, the BASS and TREBLE tone control circuits are removed from the signal path. When the TONE switch is ON, the signals pass through the 20kHz TREBLE switch, 100Hz BASS switch, emitter follower, 10kHz TREBLE switch, 50Hz BASS switch and flat amplifier, to the TONE switch. The tone control circuits are CR network, with independent circuits for each switch position giving precise control characteristics.
The BASS and TREBLE circuits are connected in two series pairs, 100Hz and 20kHz and 50Hz and 10kHz. (These groupings are chosen to maximize the frequency differences.) In this way interference when the tone control switches are operated is eliminated. An emitter follower is provided between the two series circuits.



Operation at different points

Filter Circuit

The two low cut and two high cut filters are selected by the LOW FILTER and HIGH FILTER switches.
The 30Hz cut-off low cut filter and 8kHz cut-off high cut filter are active filters, each using one transistor, with attenuation characteristics of 18dB/oct.
The 15Hz low cut and 12kHz high cut filters are CR and LC passive filters respectively, with attenuation characteristics of 12dB/oct.

Muting Circuit

The muting circuit operates for about 10 seconds after the power is switched on by cancelling the signals to prevent noise during the warming up period. It also operates immediately after the switch is set OFF.

1. Immediately after the power is set ON

a. When the power switch is set to ON, the base voltage of Q_1 is instantly cut by negative voltage from D_1.
b. The voltage across C_1 increases as it is charged by the +70V power supply via R_4 and R_1; the time constant of charging is determined by the value of $R_1 \cdot C_1$.
c. In the Schmitt circuit Q_2 and Q_3, Q_2 is OFF and Q_3 is ON until C_1 is charged.
d. When Q_3 is ON, the voltage drop caused by R_3 applies reverse bias to D_3 and D_4. Q_4 is not biased.
e. Q_4 is cut off and current flows via R_5 to the relay coil. Now, C_2 is charged from the +81V power supply via D_5. When current flows through the relay coil, the contacts close so that the signals are grounded and not fed to the OUTPUT terminals.
f. Because C_2 is incorporated into the +81V power supply circuit, a slight time lag occurs. To shorten this time lag so that current flows through the relay circuit earlier, an additional +20V power source supplies power via diode D_6.

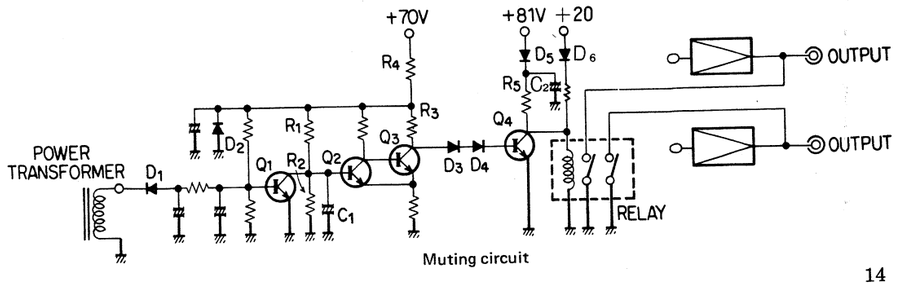
2. About 10 seconds later

a. Q_1 remains off as the reverse bias is maintained.
b. Q_2 is biased; this bias is determined by the ratio of the voltages across R_1 and R_2 after C_1 is charged. This makes Q_2 ON and Q_3 OFF.
c. As the voltage drop caused by R_3 stops almost completely, D_3 and D_4 become conducting. This applies forward bias to Q_4 to turn it ON.
d. Most current from R_5 goes to Q_4, so the current in the relay coil is not sufficient to keep the contacts closed, so normal operation starts when the contacts open and the signals are fed to the OUTPUT terminals.

3. Immediately after the power switch is set OFF

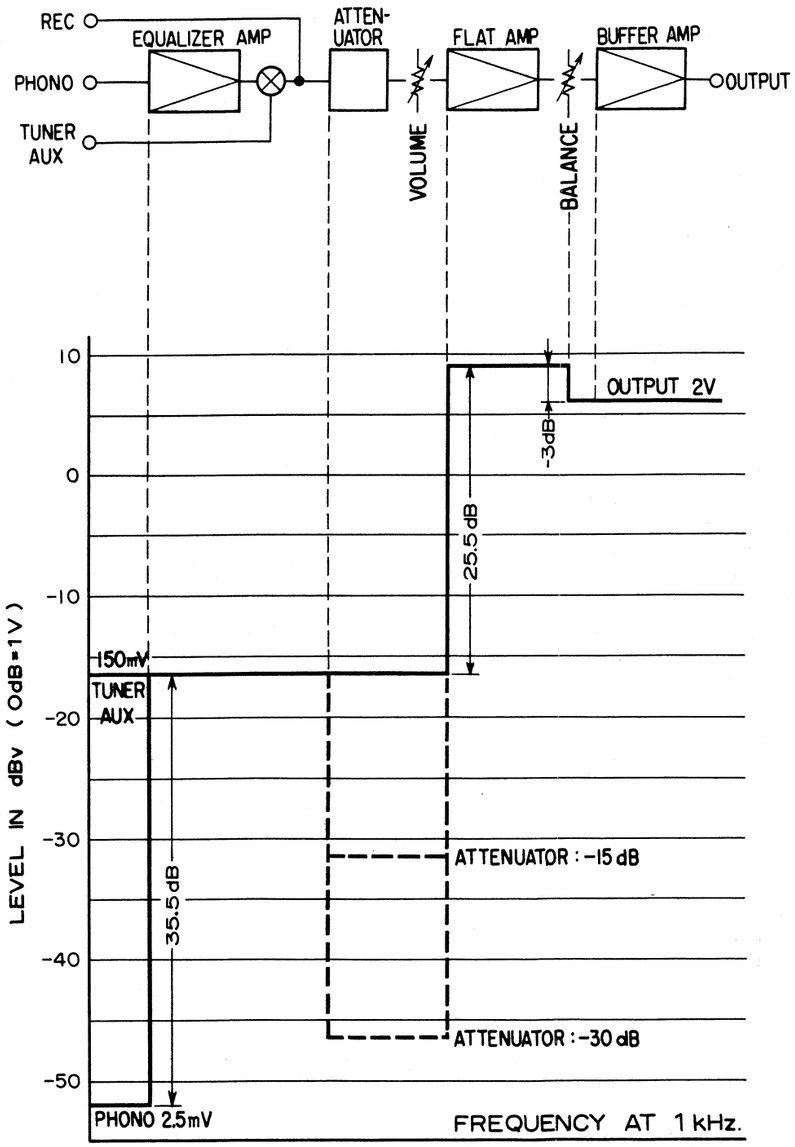
a. The capacitor in the filter circuit instantly discharges its negative charge because its capacity is low and the +70V circuit supplies power. This biases the base of Q_1 forward and Q_1 is turned ON.
b. When Q_1's residual impedance becomes low, C_1 is discharged through Q_1 and Q_2 goes OFF.
c. Q_3 is turned ON by the residual charge of the capacitors in the +70V power supply circuit. At the same time Q_4 is switched OFF.
d. The residual charge from the +81V power source is discharged through the relay coil. Without C_2, the rise and fall of +81V would be very rapid. Thus, the time the relay's contacts are closed is very short. Sometimes noise is generated a few seconds after the power switch is set OFF. To prevent this, C_2 is charged in advance. It is discharged through R_5, preventing noise by making the time the relay's contacts are closed about 10 seconds.

This is provided so that noise caused by unstable bias will not occur:
1) When power is switched ON, muting operates.
2) When power is switched OFF, the output is cut immediately.



Muting circuit

6. LEVEL DIAGRAM



7. DISASSEMBLY

Wooden Cabinet

1. Remove the six screws at the bottom of the wooden cabinet and pull out the amplifier.

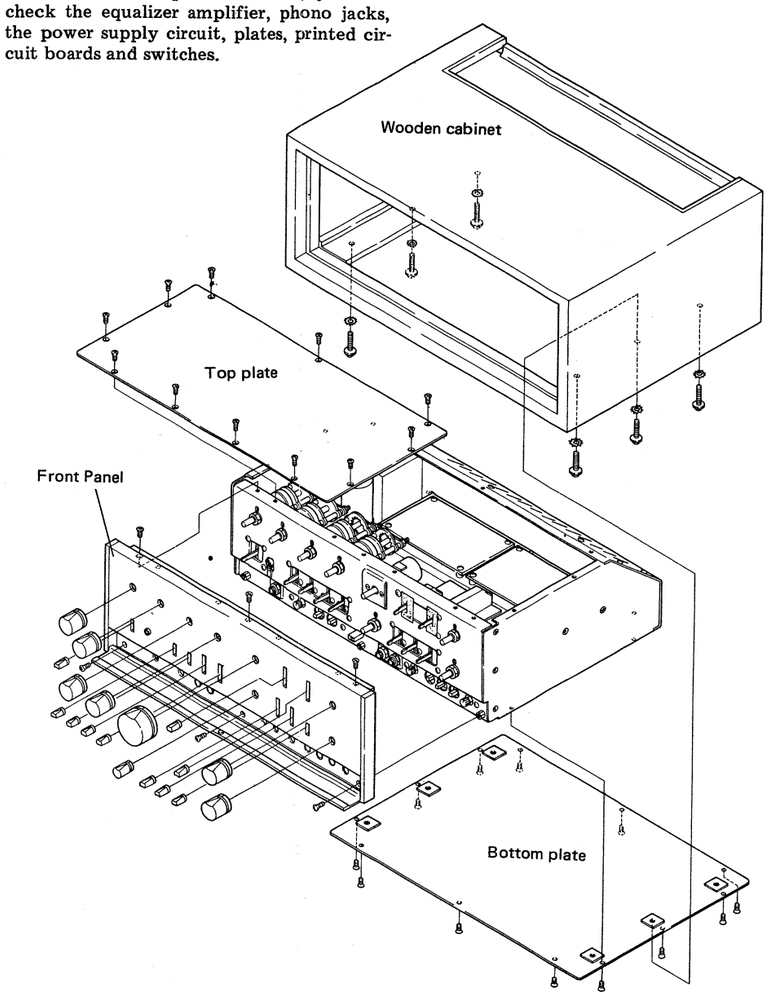
Top Plate / Bottom Plate

2. Remove the 11 screws to detach the top plate. With the top plate detached, the control amplifier can be examined.
3. Remove the 12 screws to take out the bottom plate.

   With the bottom plate detached, you can check the equalizer amplifier, phono jacks, the power supply circuit, plates, printed circuit boards and switches.

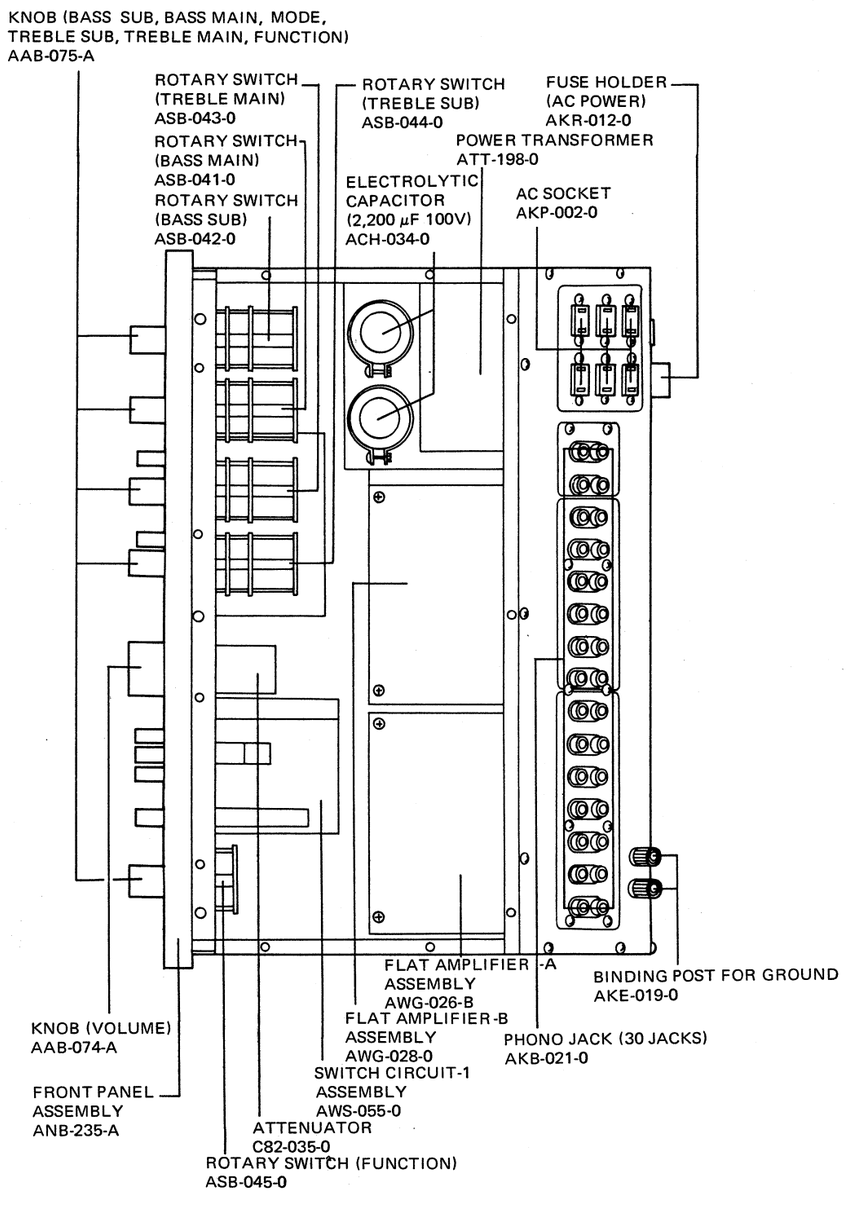
Front Panel

4. Remove the eight knobs with the hexagonal wrench provided and pull out the levers to disengage the front panel for replacement.
5. Remove the three screws in the sub-panel and the three screws at the top of front panel to detach the front panel.

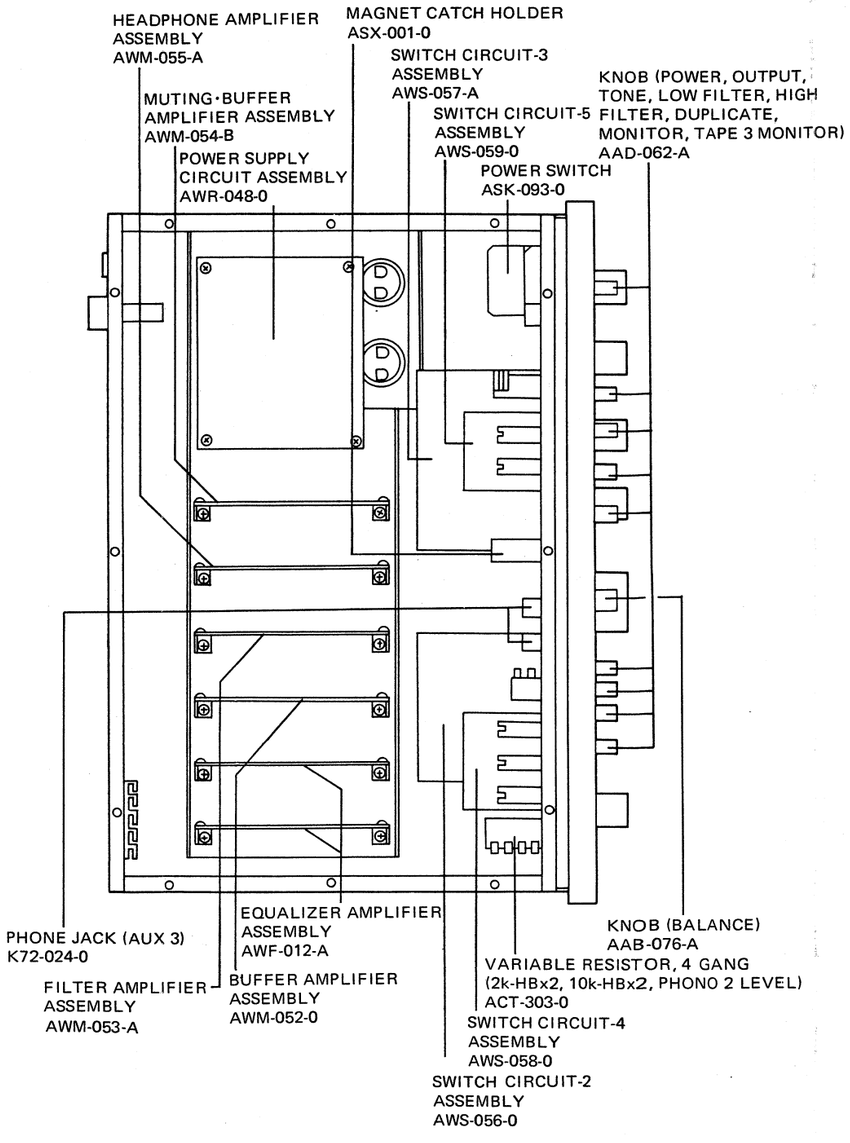


8. PARTS AND P.C. BOARD LOCATIONS

Top View


KNOB (BASS SUB, BASS MAIN, MODE, TREBLE SUB, TREBLE MAIN, FUNCTION) AAB-075-A
ROTARY SWITCH (TREBLE MAIN) ASB-043-0
ROTARY SWITCH (BASS MAIN) ASB-041-0
ROTARY SWITCH (BASS SUB) ASB-042-0
ROTARY SWITCH (TREBLE SUB) ASB-044-0
FUSE HOLDER (AC POWER) AKR-012-0
POWER TRANSFORMER ATT-198-0
ELECTROLYTIC CAPACITOR (2,200 μF 100V) ACH-034-0
AC SOCKET AKP-002-0
KNOB (VOLUME) AAB-074-A
FRONT PANEL ASSEMBLY ANB-235-A
ATTENUATOR C82-035-0
ROTARY SWITCH (FUNCTION) ASB-045-0
SWITCH CIRCUIT-1 ASSEMBLY AWS-055-0
FLAT AMPLIFIER-B ASSEMBLY AWG-028-0
FLAT AMPLIFIER-A ASSEMBLY AWG-026-B
PHONO JACK (30 JACKS) AKB-021-0
BINDING POST FOR GROUND AKE-019-0

Bottom View

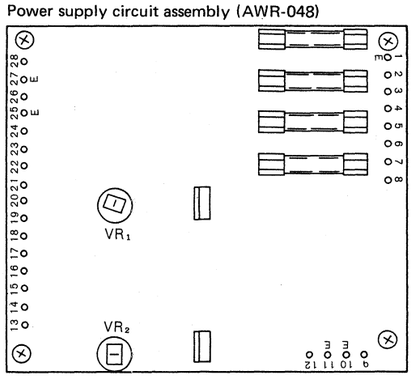

HEADPHONE AMPLIFIER ASSEMBLY AWM-055-A
MAGNET CATCH HOLDER ASX-001-0
SWITCH CIRCUIT-3 ASSEMBLY AWS-057-A
KNOB (POWER, OUTPUT, TONE, LOW FILTER, HIGH FILTER, DUPLICATE, MONITOR, TAPE 3 MONITOR) AAD-062-A
MUTING·BUFFER AMPLIFIER ASSEMBLY AWM-054-B
SWITCH CIRCUIT-5 ASSEMBLY AWS-059-0
POWER SUPPLY CIRCUIT ASSEMBLY AWR-048-0
POWER SWITCH ASK-093-0
PHONE JACK (AUX 3) K72-024-0
FILTER AMPLIFIER ASSEMBLY AWM-053-A
BUFFER AMPLIFIER ASSEMBLY AWM-052-0
EQUALIZER AMPLIFIER ASSEMBLY AWF-012-A
KNOB (BALANCE) AAB-076-A
VARIABLE RESISTOR, 4 GANG (2k-HBx2, 10k-HBx2, PHONO 2 LEVEL) ACT-303-0
SWITCH CIRCUIT-4 ASSEMBLY AWS-058-0
SWITCH CIRCUIT-2 ASSEMBLY AWS-056-0

9. ALIGNMENT PROCEDURE

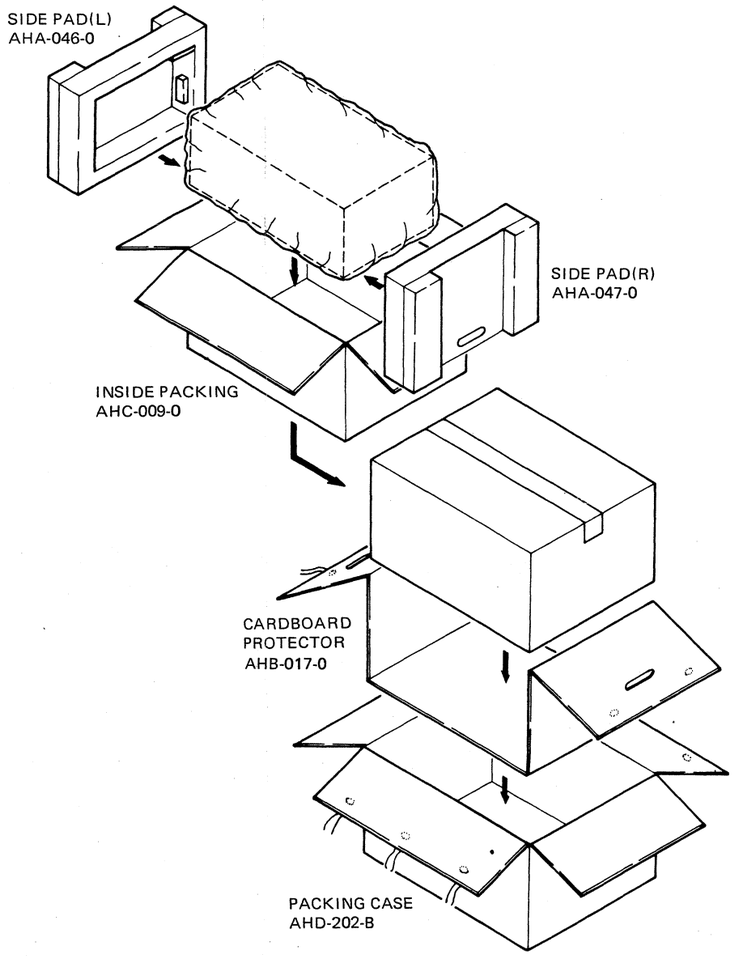
Adjustment of Power Supply Circuit

1. Turn the power switch ON.
2. Connect a DC voltmeter between No. 24 terminal of the power supply circuit assembly and ground. Adjust VR_1 to obtain output voltage of +70V.
3. Connect the DC voltmeter between No. 13 terminal and ground and adjust VR_2 to make the output voltage −70V.

Power supply circuit assembly (AWR-048)



10. PACKING METHOD AND PART NUMBERS



11. EXPLODED VIEW AND PARTS LISTS

NOTE:
Parts number is subject to change for the purpose of improvement with notice of a service bulletin.
Service bulletin will be furnished whenever necessary and you are requested to amend parts number in this manual according to the instructions.

NOTICE: Any parts asterisked (*) are subject to being not supplied.

Parts List of Exploded View

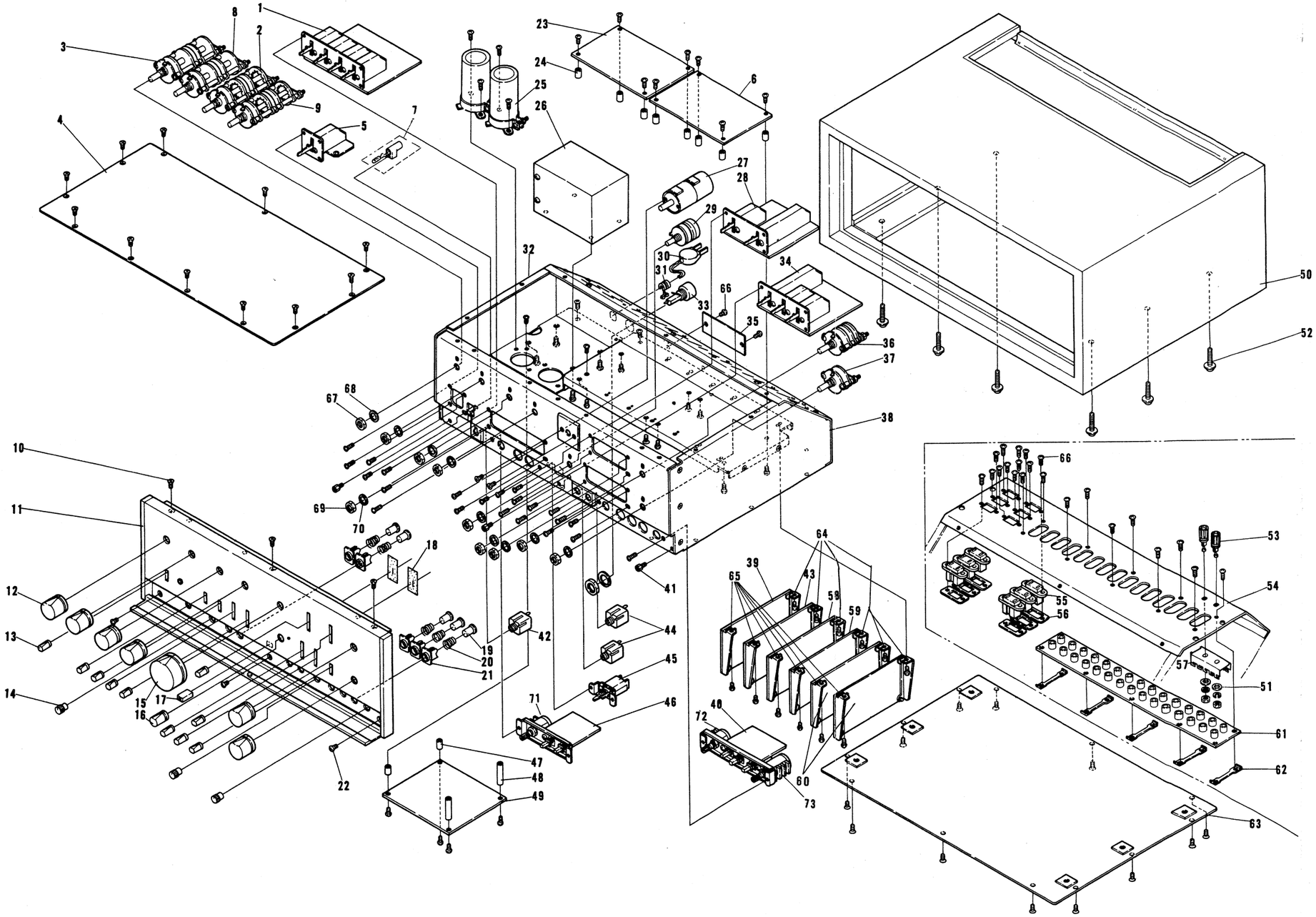
Key No.	Description	Part No.	
1	Switch circuit-3 assembly	AWS-057-A	
2	Rotary switch (TREBLE MAIN)	ASB-043-0	
3	Rotary switch (BASS SUB)	ASB-042-0	
4*	Top plate	ANE-044-0	
5	Lever switch (Power)	ASK-093-0	
6	Flat amplifier-A assembly	AWG-026-B	
7	Pilot lamp	AEL-010-0	
8	Rotary switch (BASS MAIN)	ASB-041-0	
9	Rotary switch (TREBLE SUB)	ASB-044-0	
10	Screw M3x6		
11	Front panel assembly	ANB-235-A	
12	Knob (bass sub, bass main, treble sub, treble main, function, mode)	AAB-075-A	
13	Knob (power, output, tone, low filter, high filter, attenuator, function, duplicate, monitor, tape 3 monitor)	AAD-062-A	
14	Knob (headphone level, aux 3 level, phono 2 level)	AAB-073-0	
15	Knob (volume)	AAB-074-A	
16	Knob (balance)	AAB-076-A	
17	Magnet catch	AAE-010-0	
18	Shading plate	AED-018-0	
19	Knob (output, phono 2 impedance)	AAD-061-0	
20	Spring	AEF-002-B	
21	Push knob spacer	AEC-090-0	
22	Screw M3x5		
23	Flat amplifier assembly	AWG-028-0	
24*	P.C. board holder-A	ABE-008-0	
25	Electrolytic capacitor	ACH-034-0	
26	Power transformer	ATT-198-0	
27	Attenuator 50kΩx2 (volume)	C82-035-0	
28	Switch circuit-1 assembly	AWS-055-0	
29	Variable resistor 50kΩ-AC (balance)	ACV-129-0	
30	AC power cord	ADG-002-A	
31	AC cord grommet	AEC-079-0	
32*	Side panel (L)	ANE-042-0	
33	Fuse holder (AC power)	AKR-012-0	
34	Switch circuit-2 assembly	AWS-056-0	
35*	Model name plate	AAL-223-0	

Continued on the Next Page

NOTICE: Any parts asterisked (*) are subject to being not supplied.

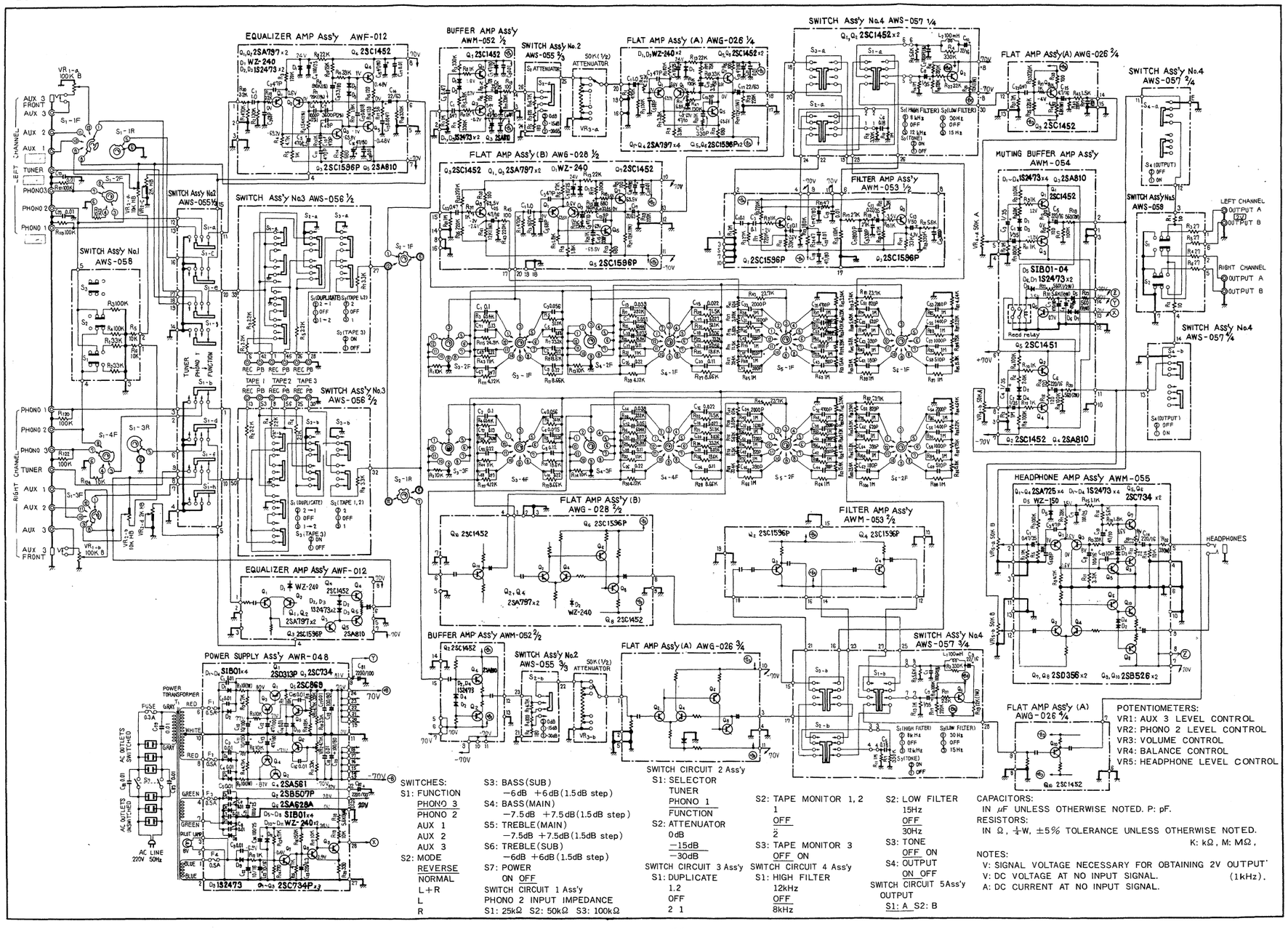
Key No.	Description	Part No.	
36	Rotary switch (FUNCTION)	ASB-045-0	
37	Rotary switch (MODE)	ASB-040-0	
38*	Side panel (R)	ANE-043-0	
39	Muting, buffer amplifier assembly	AWM-054-B	
40	Switch circuit-4 assembly	AWS-058-0	
41	Front panel holder	ALA-010-0	
42	Phono jack (headphone)	K72-026-0	
43	Headphone amplifier assembly	AWM-055-A	
44	Phono jack (aux. 3)	K72-024-0	
45	Magnet catch holder	ASX-001-0	
46	Switch circuit-5 assembly	AWS-059-0	
47*	P.C. board holder-A	ABE-008-0	
48*	P.C. board holder-B	ABE-009-0	
49	Power supply circuit assembly	AWR-048-0	
50	Wooden cabinet	AMM-029-B	
51	Washer	ABE-007-0	
52	Screw M4x26	ABA-011-A	
53	Binding post for ground	AKE-019-0	
54*	Rear panel	ANC-097-A	
55	AC socket	AKP-002-0	
56*	AC socket-held metal	ANF-191-0	
57	Ground terminal	AKE-028-0	
58	Filter amplifier assembly	AWM-053-A	
59	Buffer amplifier assembly	AWM-052-0	
60	Equalizer amplifier assembly	AWF-012-A	
61	Phono jack (30 jacks)	AKB-021-0	
62*	Phono jack-held metal	M49-052-A	
63*	Bottom plate	ANE-045-0	
64*	P.C. board-held metal A	ANF-185-0	
65*	P.C. board-held metal B	ANF-186-0	
66	Screw M3x6	ABA-003-0	
67	Nut 9ϕ	B71-004-0	
68	Washer 9ϕ	ABE-001-0	
69	Nut 7ϕ	B71-010-0	
70	Washer 7ϕ	ABE-006-0	
71	Variable resistor, 50k-Bx2(headphone level)	ACT-111-0	
72	Variable resistor, 100k-Bx2(aux 3 level)	ACT-110-0	
73	Variable resistor, 2k-HBx2, 10k-HBx2 (phono 2 level)	ACT-303-0	

Exploded View



12. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LISTS

12.1 CIRCUIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS


EQUALIZER AMP Ass'y AWF-012
BUFFER AMP Ass'y AWM-052 1/2
SWITCH Ass'y No.2 AWS-055 2/3
FLAT AMP Ass'y (A) AWG-026 1/4
SWITCH Ass'y No.4 AWS-057 1/4
FLAT AMP Ass'y (B) AWG-028 1/2
FILTER AMP Ass'y AWM-053 1/2
FLAT AMP Ass'y(A) AWG-026 3/4
SWITCH Ass'y No.4 AWS-057 2/4
MUTING BUFFER AMP Ass'y AWM-054
SWITCH Ass'y No.5 AWS-058
SWITCH Ass'y No.1 AWS-058
SWITCH Ass'y No.3 AWS-056 1/2
SWITCH Ass'y No.3 AWS-056 2/2
SWITCH Ass'y No.4 AWS-057 1/4
HEADPHONE AMP Ass'y AWM-055
HEADPHONES
LEFT CHANNEL
RIGHT CHANNEL
OUTPUT A
OUTPUT B
POWER SUPPLY Ass'y AWR-048
POWER TRANSFORMER
AC OUTLETS SWITCHED
AC OUTLETS UNSWITCHED
AC LINE 220V 50Hz
FUSE 0.3A
FUSE 0.5A
FLAT AMP Ass'y (B) AWG-028 2/2
BUFFER AMP Ass'y AWM-052 2/2
SWITCH Ass'y No.2 AWS-055 3/3
SWITCH Ass'y No.4 AWS-057 3/4
FLAT AMP Ass'y (A) AWG-026 4/4
FILTER AMP Ass'y AWM-053 2/2
SWITCH CIRCUIT 2 Ass'y
SWITCH CIRCUIT 3 Ass'y
SWITCH CIRCUIT 4 Ass'y
SWITCH CIRCUIT 5Ass'y
POTENTIOMETERS:
VR1: AUX 3 LEVEL CONTROL
VR2: PHONO 2 LEVEL CONTROL
VR3: VOLUME CONTROL
VR4: BALANCE CONTROL
VR5: HEADPHONE LEVEL CONTROL

SWITCHES:
S1: FUNCTION
PHONO 3
PHONO 2
AUX 1
AUX 2
AUX 3
S2: MODE
REVERSE
NORMAL
L+R
L
R

S3: BASS(SUB)
−6dB +6dB(1.5dB step)
S4: BASS(MAIN)
−7.5dB +7.5dB(1.5dB step)
S5: TREBLE(MAIN)
−7.5dB +7.5dB(1.5dB step)
S6: TREBLE(SUB)
−6dB +6dB(1.5dB step)
S7: POWER
ON OFF
SWITCH CIRCUIT 1 Ass'y
PHONO 2 INPUT IMPEDANCE
S1: 25kΩ S2: 50kΩ S3: 100kΩ

SWITCH CIRCUIT 2 Ass'y
S1: SELECTOR
TUNER
PHONO 1
FUNCTION
S2: ATTENUATOR
0dB
−15dB
−30dB
SWITCH CIRCUIT 3 Ass'y
S1: DUPLICATE
1.2
OFF
2 1

S2: TAPE MONITOR 1, 2
1
OFF
2
S3: TAPE MONITOR 3
OFF ON
SWITCH CIRCUIT 4 Ass'y
S1: HIGH FILTER
12kHz
OFF
8kHz

S2: LOW FILTER
15Hz
OFF
30Hz
S3: TONE
OFF ON
S4: OUTPUT
ON OFF
SWITCH CIRCUIT 5Ass'y
OUTPUT
S1: A S2: B

CAPACITORS:
IN μF UNLESS OTHERWISE NOTED. P: pF.
RESISTORS:
IN Ω, ¼W, ±5% TOLERANCE UNLESS OTHERWISE NOTED.
K: kΩ, M: MΩ,
NOTES:
V: SIGNAL VOLTAGE NECESSARY FOR OBTAINING 2V OUTPUT' (1kHz).
V: DC VOLTAGE AT NO INPUT SIGNAL.
A: DC CURRENT AT NO INPUT SIGNAL.

- CAPACITORS: IN μF UNLESS OTHERWISE NOTED P: pF
- RESISTORS: INΩ, ¼W UNLESS OTHERWISE NOTED k: kΩ, M: MΩ.

Miscellaneous Parts

CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.1	50V	CQMA 104J 50R	
C2	Mylar	0.1	50V	CQMA 104J 50R	
C3	Mylar	0.056	50V	CQMA 563J 50R	
C4	Mylar	0.056	50V	CQMA 563J 50R	
C5	Mylar	0.075	50V	CQMA 753J 50R	
C6	Mylar	0.075	50V	CQMA 753J 50R	
C7	Mylar	0.12	50V	CQMA 124J 50R	
C8	Mylar	0.12	50V	CQMA 124J 50R	
C9	Mylar	0.22	50V	CQMA 224J 50R	
C10	Mylar	0.22	50V	CQMA 224J 50R	
C11	Mylar	0.051	50V	CQMA 513J 50R	
C12	Mylar	0.051	50V	CQMA 513J 50R	
C13	Mylar	0.039	50V	CQMA 393J 50R	
C14	Mylar	0.039	50V	CQMA 393J 50R	
C15	Mylar	0.022	50V	CQMA 223J 50R	
C16	Mylar	0.022	50V	CQMA 223J 50R	
C17	Mylar	0.027	50V	CQMA 273J 50R	
C18	Mylar	0.027	50V	CQMA 273J 50R	
C19	Mylar	0.036	50V	CQMA 363J 50R	
C20	Mylar	0.036	50V	CQMA 363J 50R	
C21	Mylar	0.056	50V	CQMA 563J 50R	
C22	Mylar	0.056	50V	CQMA 563J 50R	
C23	Mylar	0.11	50V	CQMA 114J 50R	
C24	Mylar	0.11	50V	CQMA 114J 50R	
C25	Mylar	0.22	50V	CQMA 224J 50R	
C26	Mylar	0.22	50V	CQMA 224J 50R	
C27	Mylar	0.11	50V	CQMA 114J 50R	
C28	Mylar	0.11	50V	CQMA 114J 50R	
C29	Mylar	0.075	50V	CQMA 753J 50R	
C30	Mylar	0.075	50V	CQMA 753J 50R	
C31	Styrol	1600p	50V	CQSB 162J 50	
C32	Styrol	1600p	50V	CQSB 162J 50	
C33	Styrol	2000p	50V	CQSB 202J 50	
C34	Styrol	2000p	50V	CQSB 202J 50	
C35	Styrol	4700p	50V	CQSB 472J 50	
C36	Styrol	4700p	50V	CQSB 472J 50	
C37	Styrol	3900p	50V	CQSB 392J 50	
C38	Styrol	3900p	50V	CQSB 392J 50	
C39	Styrol	2700p	50V	CQSB 272J 50	
C40	Styrol	2700p	50V	CQSB 272J 50	
C41	Styrol	1800p	50V	CQSB 182J 50	
C42	Styrol	1800p	50V	CQSB 182J 50	
C43	Styrol	910p	50V	CQSB 911J 50	
C44	Styrol	910p	50V	CQSB 911J 50	
C45	Styrol	390p	50V	CQSB 391J 50	

Continued on the Next Page

Symbol	Description			Part No.	
C46	Styrol	390p	50V	CQSB 391J 50	
C47	Styrol	820p	50V	CQSB 821J 50	
C48	Styrol	820p	50V	CQSB 821J 50	
C49	Styrol	1200p	50V	CQSB 122J 50	
C50	Styrol	1200p	50V	CQSB 122J 50	
C51	Styrol	820p	50V	CQSB 821J 50	
C52	Styrol	820p	50V	CQSB 821J 50	
C53	Styrol	2000p	50V	CQSB 202J 50	
C54	Styrol	2000p	50V	CQSB 202J 50	
C55	Styrol	1400p	50V	CQSB 142J 50	
C56	Styrol	1400p	50V	CQSB 142J 50	
C57	Styrol	1000p	50V	CQSB 102J 50	
C58	Styrol	1000p	50V	CQSB 102J 50	
C59	Styrol	510p	50V	CQSB 511J 50	
C60	Styrol	510p	50V	CQSB 511J 50	
C61	Styrol	180p	50V	CQSB 181J 50	
C62	Styrol	180p	50V	CQSB 181J 50	
C63	Styrol	390p	50V	CQSB 391J 50	
C64	Styrol	390p	50V	CQSB 391J 50	
C65	Styrol	620p	50V	CQSB 621J 50	
C66	Styrol	620p	50V	CQSB 621J 50	
C67	Metallized mylar	0.47	50V	CQEA 474J 50	
C68	Metallized mylar	0.47	50V	CQEA 474J 50	
C69	Mylar	0.22	50V	CQMA 224J 50R	
C70	Mylar	0.22	50V	CQMA 224J 50R	
C71	Mylar	0.13	50V	CQMA 134J 50R	
C72	Mylar	0.13	50V	CQMA 134J 50R	
C73	Ceramic	0.01	50V	CKDYF 103Z 50	
C74	Ceramic				
C75	Ceramic	0.01	50V	CKDYF 103Z 50	
C76					
C77	Ceramic	0.01	50V	CKDYF 103Z 50	
C78					
C79	Ceramic	0.01	250V	ACG-001-0	
C80	Ceramic	0.01	250V	ACG-001-0	
C81	Electrolytic	2,200	100V	ACH-034-0	
C82	Electrolytic	2,200	100V	ACH-034-0	
C83	Ceramic	0.01	250V	ACH-034-0	

RESISTORS AND POTENTIOMETERS

Symbol	Description		Part No.	
R1	Metal film	10k	RN¼SR 1002F	
R2	Metal film	10k	RN¼SR 1002F	
R3	Metal film	60.4k	RN¼SR 6042F	
R4	Metal film	60.4k	RN¼SR 6042F	
R5	Metal film	51.1k	RN¼SR 5112F	
R6	Metal film	51.1k	RN¼SR 5112F	
R7	Metal film	33.2k	RN¼SR 3322F	
R8	Metal film	33.2k	RN¼SR 3322F	
R9	Metal film	19.6k	RN¼SR 1962F	
R10	Metal film	19.6k	RN¼SR 1962F	
R11	Metal film	8.66k	RN¼SR 8661F	
R12	Metal film	8.66k	RN¼SR 8661F	
R13	Metal film	10k	RN¼SR 1002F	
R14	Metal film	10k	RN¼SR 1002F	
R15	Metal film	60.4k	RN¼SR 6042F	
R16	Metal film	60.4k	RN¼SR 6042F	
R17	Metal film	392k	RN¼SR 3923F	
R18	Metal film	392k	RN¼SR 3923F	
R19	Metal film	71.5k	RN¼SR 7152F	
R20	Metal film	71.5k	RN¼SR 7152F	
R21	Metal film	51.1k	RN¼SR 5112F	
R22	Metal film	51.1k	RN¼SR 5112F	
R23	Metal film	33.2k	RN¼SR 3322F	
R24	Metal film	33.2k	RN¼SR 3322F	
R25	Metal film	19.6k	RN¼SR 1962F	
R26	Metal film	19.6k	RN¼SR 1962F	
R27	Metal film	8.66k	RN¼SR 8661F	
R28	Metal film	8.66k	RN¼SR 8661F	
R29	Metal film	4.12k	RN¼SR 4121F	
R30	Metal film	4.12k	RN¼SR 4121F	
R31	Metal film	11k	RN¼SR 1102F	
R32	Metal film	11k	RN¼SR 1102F	
R33	Metal film	24.9k	RN¼SR 2492F	
R34	Metal film	24.9k	RN¼SR 2492F	
R35	Carbon film	1M	RD¼PM 105J	
R36	Carbon film	1M	RD¼PM 105J	
R37	Metal film	3.09k	RN¼SR 3091F	
R38	Metal film	3.09k	RN¼SR 3091F	
R39	Carbon film	1M	RD¼PM 105J	
R40	Carbon film	1M	RD¼PM 105J	
R41	Metal film	604	RN¼SR 6040F	
R42	Metal film	604	RN¼SR 6040F	
R43	Metal film	23.7k	RN¼SR 2372F	
R44	Metal film	23.7k	RN¼SR 2372F	
R45	Metal film	3.24k	RN¼SR 3241F	
R46	Metal film	3.24k	RN¼SR 3241F	
R47	Carbon film	1M	RD¼PM 105J	
R48	Carbon film	1M	RD¼PM 105J	
R49	Metal film	1.33k	RN¼SR 1331F	
R50	Metal film	1.33k	RN¼SR 1331F	

Continued on the Next Page

Symbol	Description		Part No.	
R51	Carbon film	1M	RD¼PM 105J	
R52	Carbon film	1M	RD¼PM 105J	
R53	Metal film	2.43k	RN¼SR 2431F	
R54	Metal film	2.43k	RN¼SR 2431F	
R55	Carbon film	1M	RD¼PM 105J	
R56	Carbon film	1M	RD¼PM 105J	
R57	Metal film	4.99k	RN¼SR 4991F	
R58	Metal film	4.99k	RN¼SR 4991F	
R59	Carbon film	1M	RD¼PM 105J	
R60	Carbon film	1M	RD¼PM 105J	
R61	Metal film	15.4k	RN¼SR 1542F	
R62	Metal film	15.4k	RN¼SR 1542F	
R63	Carbon film	1M	RD¼PM 105J	
R64	Carbon film	1M	RD¼PM 105J	
R65	Carobn film	1M	RD¼PM 105J	
R66	Carbon film	1M	RD¼PM 105J	
R67	Metal film	32.4k	RN¼SR 3242F	
R68	Metal film	32.4k	RN¼SR 3242F	
R69	Carbon film	1M	RD¼PM 105J	
R70	Carbon film	1M	RD¼PM 105J	
R71	Metal film	11.5k	RN¼SR 1152F	
R72	Metal film	11.5k	RN¼SR 1152F	
R73	Carbon film	1M	RD¼PM 105J	
R74	Carbon film	1M	RD¼PM 105J	
R75	Metal film	5.62k	RN¼SR 5621F	
R76	Metal film	5.62k	RN¼SR 5621F	
R77	Carbon film	1M	RD¼PM 105J	
R78	Carbon film	1M	RD¼PM 105J	
R79	Metal film	3.74k	RN¼SR 3741F	
R80	Metal film	3.74k	RN¼SR 3741F	
R81	Metal film	23.7k	RN¼SR 2372F	
R82	Metal film	23.7k	RN¼SR 2372F	
R83	Metal film	4.64k	RN¼SR 4641F	
R84	Metal film	4.64k	RN¼SR 4641F	
R85	Carbon film	1M	RD¼PM 105J	
R86	Carbon film	1M	RD¼PM 105J	
R87	Metal film	2.21k	RN¼SR 2211F	
R88	Metal film	2.21k	RN¼SR 2211F	
R89	Carbon film	1M	RD¼PM 105J	
R90	Carbon film	1M	RD¼PM 105J	
R91	Metal film	4.75k	RN¼SR 4751F	
R92	Metal film	4.75k	RN¼SR 4751F	
R93	Carbon film	1M	RD¼PM 105J	
R94	Carbon film	1M	RD¼PM 105J	
R95	Metal film	15.8k	RN¼SR 1582F	

Symbol	Description	Part No.	
R96	Metal film 15.8k	RN¼SR 1582F	
R97	Carbon film 1M	RD¼PM 105J	
R98	Carbon film 1M	RD¼PM 105J	
R99	Carbon film 1M	RD¼PM 105J	
R100	Carbon film 1M	RD¼PM 105J	
R101	Metal film 29.4k	RN¼SR 2942F	
R102	Metal film 29.4k	RN¼SR 2942F	
R103	Carbon film 1M	RD¼PM 105J	
R104	Carbon film 1M	RD¼PM 105J	
R105	Metal film 11.8k	RN¼SR 1182F	
R106	Metal film 11.8k	RN¼SR 1182F	
R107	Carbon film 1M	RD¼PM 105J	
R108	Carbon film 1M	RD¼PM 105J	
R109	Metal film 5.49k	RN¼SR 5491F	
R110	Metal film 5.49k	RN¼SR 5491F	
R111	Metal film 4.12K	RN¼SR 4121F	
R112	Metal film 4.12k	RN¼SR 4121F	
R113	Metal film 11k	RN¼SR 1102F	
R114	Metal film 11k	RN¼SR 1102F	
R115	Metal film 24.9k	RN¼SR 2492F	
R116	Metal film 24.9k	RN¼SR 2492F	
R119	Carbon film 100k	RD¼PS 104J	
R120	Carbon film 100k	RD¼PS 104J	
R121	Carbon film 100k	RD¼PS 104J	
R122	Carbon film 100k	RD¼PS 104J	
R123	Carbon film 10k	RD¼PM 103J	
R124	Carbon film 10k	RD¼PM 103J	
VR1	Variable resistor, 100k-Bx2 (aux. 3 level)	ACT-110-0	
VR2	Variable resistor, 2k-HBx2, 10k-HBx2 (phono 2 level)	ACT-303-0	
VR3	Attenuator 50kx2 (volume)	C82-035-0	
VR4	Variable resistor 50k-A, C (balance)	ACV-129-0	
VR5	Variable resistor 50k-Bx2 (headphone level)	ACT-111-0	

SWITCHES

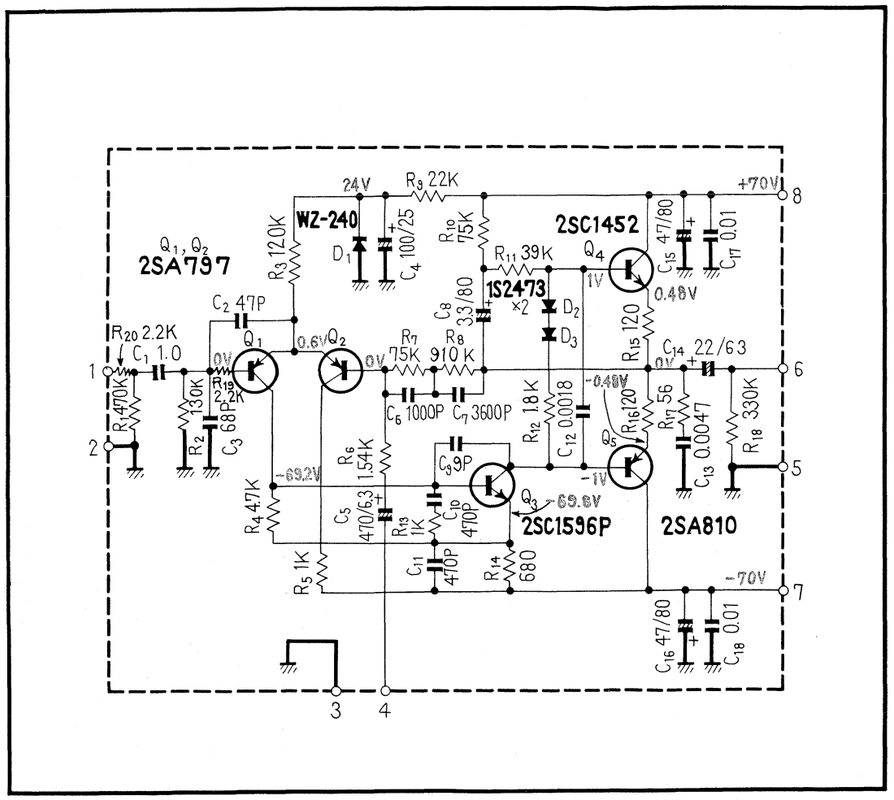
Symbol	Description	Part No.	
S1	Rotary switch (FUNCTION)	ASB-045-0	
S2	Rotary switch (MODE)	ASB-040-0	
S3	Rotary switch (BASS SUB)	ASB-042-0	
S4	Rotary switch (BASS MAIN)	ASB-041-0	
S5	Rotary switch (TREBLE MAIN)	ASB-043-0	
S6	Rotary switch (TREBLE SUB)	ASB-044-0	
S7	Lever switch (power)	ASK-093-A	

Miscellaneous parts

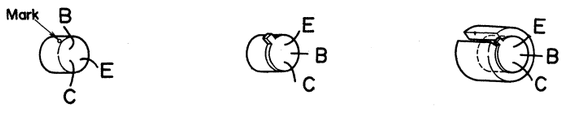
OTHERS

Symbol	Description	Part No.	
	Equalizer amplifier assembly	AWF-012-A	
	Flat amplifier-A assembly	AWG-026-B	
	Buffer amplifier assembly	AWM-052-0	
	Filter amplifier assembly	AWM-053-A	
	Muting; buffer amplifier assembly	AWM-054-B	
	Flat amplifier-B assembly	AWG-028-0	
	Headphone amplifier assembly	AWM-055-A	
	Power supply circuit assembly	AWR-048-0	
	Switch circuit-1 assembly	AWS-055-0	
	Switch circuit-2 assembly	AWS-056-0	
	Switch circuit-3 assembly	AWS-057-B	
	Switch circuit-4 assembly	AWS-058-0	
	Switch circuit-5 assembly	AWS-059-0	
	Front panel assembly	ANB-235-A	
	Knob (power, output, tone, low filter, high filter, attenuator, function, duplicate, monitor, tape 3 monitor)	AAD-062-A	
	Knob (balance)	AAB-076-A	
	Knob (volume)	AAB-074-A	
	Knob (bass sub, bass main, treble sub, treble main, function, mode)	AAB-075-A	
	Knob (aux 3 level, headphone level, phono 2 level)	AAB-073-0	
	Magnet catch	AAE-010-0	
	Knob (output, phono 2 impedance)	AAD-061-0	
	Push knob spacer	AEC-090-0	
	Phone jack (aux 3)	K72-024-0	
	Phone jack (headphone)	K72-026-0	
	Spring	AEF-002-B	
	Phono jack (30 jacks)	AKB-021-0	
	Binding post for ground	AKE-019-0	
	Socket cover	AEC-131-0	
	Connector socket	AKF-018-0	
	Pilot lamp	AEL-010-0	
	Power transformer	ATT-198-0	
	AC socket	AKP-002-0	
	AC cord grommet	AEC-079-0	
	Fuse holder	AKR-012-0	
	Fuse 0.3A	AEK-023-0	
	AC power cord	ADG-002-A	
	Operating instructions	ARB-124-A	
	Hexagonal wrench	ANK-018-0	
	Connection cord	ADE-005-0	
	Packing case	AHD-202-B	
	Inside packing	AHC-009-0	
	Side pad(L) assembly	AHA-046-0	
	Side pad(R) assembly	AHA-047-0	
	Cardboard protector	AHB-017-0	
	Wooden cabinet	AMM-029-B	

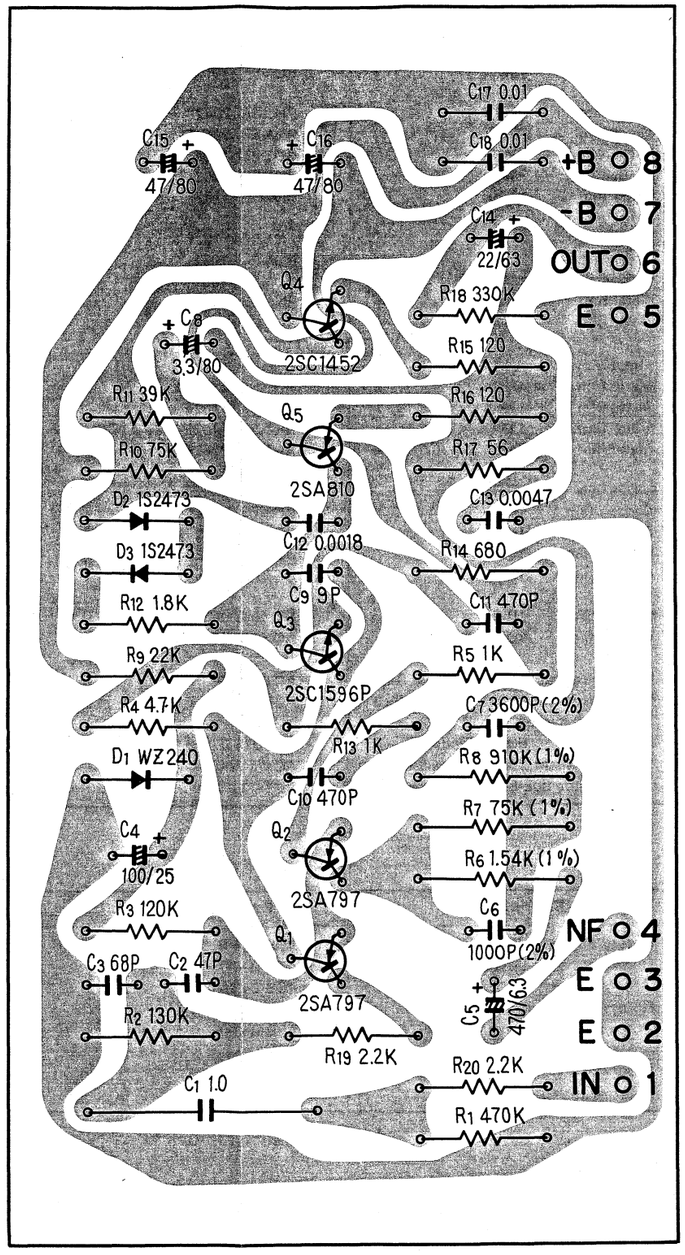
12.2 EQUALIZER AMPLIFIER ASSEMBLY (AWF-012-A)



2SA797 2SC1596P 2SA810
2SC1452



Foil side (AWF-012-A)



Parts List of Equalizer Amplifier Assembly (AWF-012-A)

CAPACITORS

Symbol	Description			Part No.	
C1	Metallized mylar	1	50V	CQEA 105K 50	
C2	Ceramic	47p	50V	CCDSL 470K 50	
C3	Ceramic	68p	50V	CCDSL 680K 50	
C4	Electrolytic	100	25V	CEA 101P 25	
C5	Electrolytic	470	6V	CEA 471P 6	
C6	Styrol	0.001	50V	CQSA 102G 50	
C7	Styrol	0.0036	50V	CQSA 362G 50	
C8	Electrolytic	3.3	80V	CEA 3R3P 80	
C9	Ceramic	9p	50V	CCDSL 090K 50	
C10	Ceramic	470p	50V	CKDYB 471K 50	
C11	Ceramic	470p	50V	CKDYB 471K 50	
C12	Ceramic	1800p	50V	CKDYB 182K 50	
C13	Mylar	0.0047	50V	CQMA 472K 50R	
C14	Electrolytic	22	63V	CEA 220P 63	
C15	Electrolytic	47	80V	CEA 470P 80	
C16	Electrolytic	47	80V	CEA 470P 80	
C17	Ceramic	0.01	500V	CKDYF 103Z 500	
C18	Ceramic	0.01	500V	CKDYF 103Z 500	

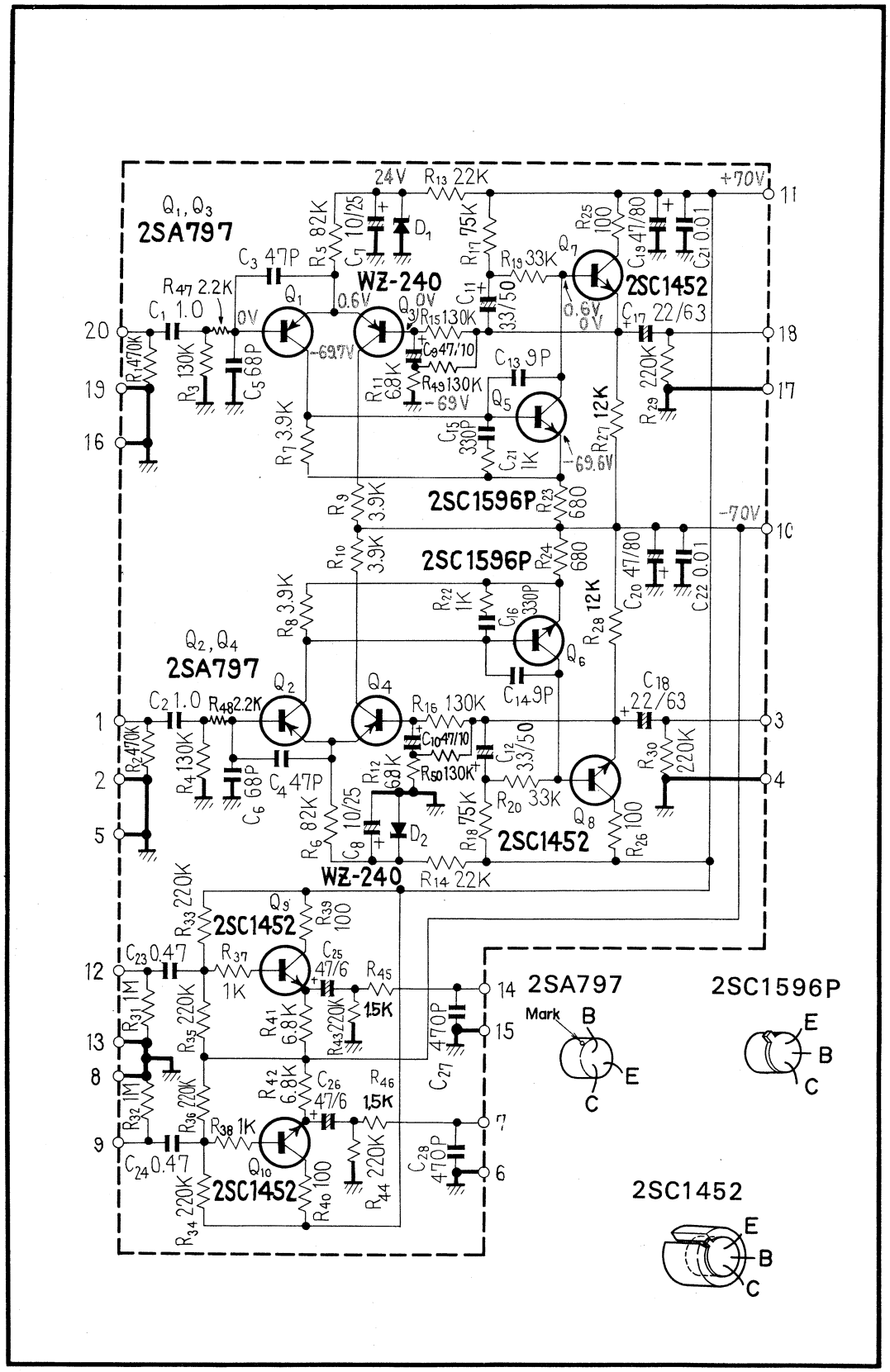
RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	470k		RD¼PS 474JNL	
R2	Carbon film	130k		RD¼PS 134JNL	
R3	Carbon film	120k		RD¼PS 124JNL	
R4	Carbon film	4.7k		RD¼PS 472JNL	
R5	Carbon film	1k		RD¼PS 102JNL	
R6	Metal film	1.54k	½W	RN½SR 1541F	
R7	Metal film	75k	½W	RN½SR 7502F	
R8	Metal film	910k	½W	RN½SR 9103F	
R9	Carbon film	22k		RD¼PS 223JNL	
R10	Carbon film	75k		RD¼PS 753JNL	
R11	Carbon film	39k		RD¼PS 393JNL	
R12	Carbon film	1.8k		RD¼PS 182JNL	
R13	Carbon film	1k		RD¼PS 102JNL	
R14	Carbon film	680		RD¼PS 681JNL	
R15	Carbon film	120		RD¼PS 121JNL	
R16	Carbon film	120		RD¼PS 121JNL	
R17	Carbon film	56		RD¼PS 560JNL	
R18	Carbon film	330k		RD¼PS 334JNL	
R19	Carbon film	2.2k		RD¼PS 222JNL	
R20	Carbon film	2.2k		RD¼PS 222JNL	

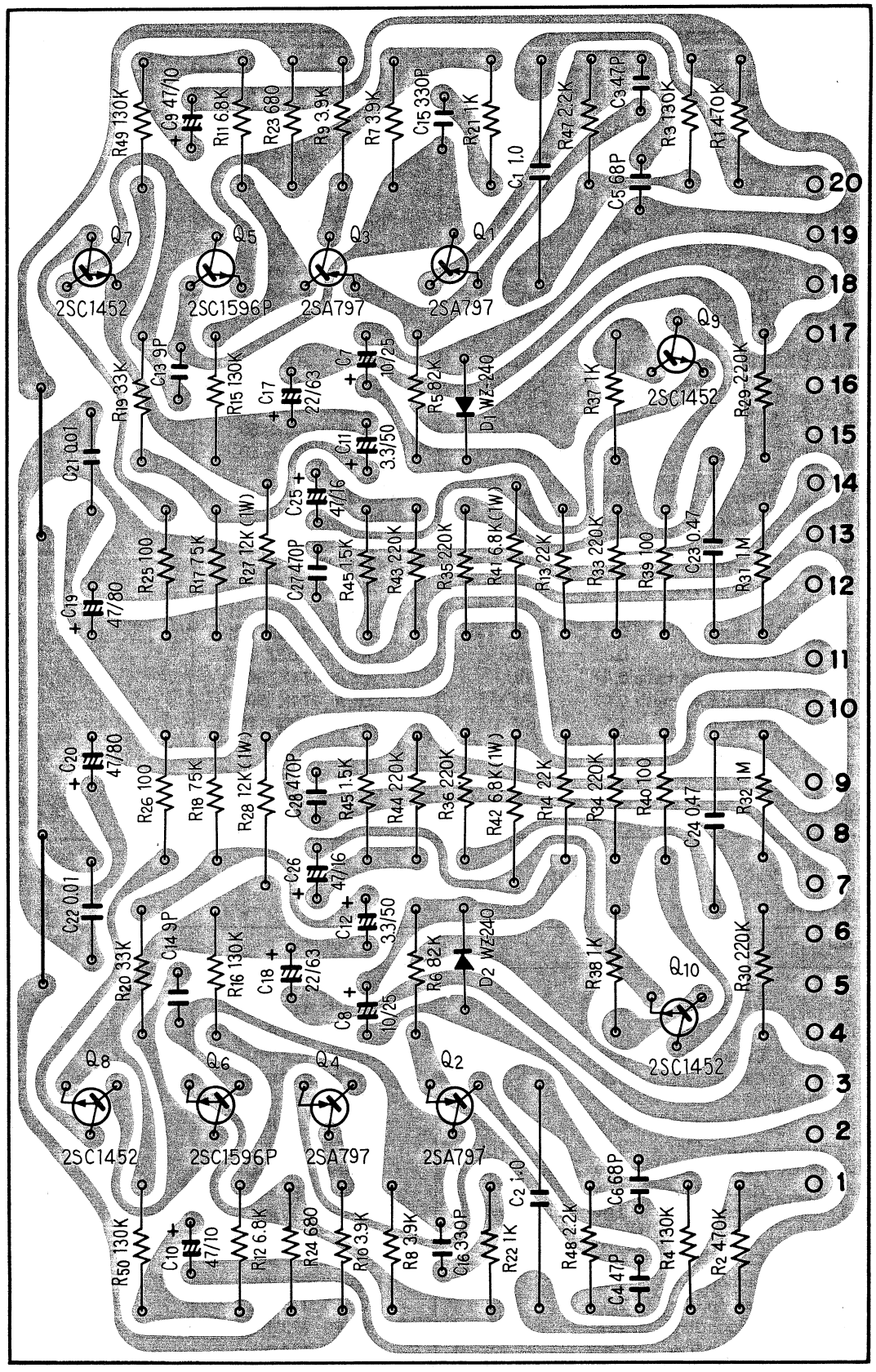
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SA797-F or G		
Q2	Transistor	2SA797-F or G		
Q3	Transistor	2SC1596P-S		
Q4	Transistor	2SC1452-B, G or V		
Q5	Transistor	2SA810-B, G or V		
D1	Zener diode	WZ-240		
D2	Diode	1S2473		
D3	Diode	1S2473		

12.3 FLAT AMPLIFIER -A ASSEMBLY (AWG-026-B)



Foil side (AWG-026-B)



Parts List of Flat Amplifier-A Assembly (AWG-026-B)

CAPACITORS

Symbol	Description			Part No.	
C1	Metallized mylar	1	50V	CQEA 105K 50	
C2	Metallized mylar	1	50V	CQEA 105K 50	
C3	Ceramic	47p	50V	CCDSL 470K 50	
C4	Ceramic	47p	50V	CCDSL 470K 50	
C5	Ceramic	68p	50V	CCDSL 680K 50	
C6	Ceramic	68p	50V	CCDSL 680K 50	
C7	Electrolytic	10	25V	CEA 100P 25	
C8	Electrolytic	10	25V	CEA 100P 25	
C9	Electrolytic	47	10V	CEA 470P 10	
C10	Electrolytic	47	10V	CEA 470P 10	
C11	Electrolytic	3.3	50V	CEANL 3R3P 50	
C12	Electrolytic	3.3	50V	CEANL 3R3P 50	
C13	Ceramic	9p	50V	CCDSL 090K 50	
C14	Ceramic	9p	50V	CCDSL 090K 50	
C15	Ceramic	330p	50V	CCDSL 331K 50	
C16	Ceramic	330p	50V	CCDSL 331K 50	
C17	Electrolytic	22	63V	CEA 220P 63	
C18	Electrolytic	22	63V	CEA 220P 63	
C19	Electrolytic	47	80V	CEA 470P 80	
C20	Electrolytic	47	80V	CEA 470P 80	
C21	Ceramic	0.01	500V	CKDYF 103Z 500	
C22	Ceramic	0.01	500V	CKDYF 103Z 500	
C23	Metallized mylar	0.47	50V	CQEA 474K 50	
C24	Metallized mylar	0.47	50V	CQEA 474K 50	
C25	Electrolytic	47	16V	CEANL 470P 16	
C26	Electrolytic	47	16V	CEANL 470P 16	
C27	Styrol	470p	50V	CQSA 471J 50	
C28	Styrol	470p	50V	CQSA 471J 50	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	470k	RD¼PS 474JNL	
R2	Carbon film	470k	RD¼PS 474JNL	
R3	Carbon film	130k	RD¼PS 134JNL	
R4	Carbon film	130k	RD¼PS 134JNL	
R5	Carbon film	82k	RD¼PS 823JNL	
R6	Carbon film	82k	RD¼PS 823JNL	
R7	Carbon film	3.9k	RD¼PS 392JNL	
R8	Carbon film	3.9k	RD¼PS 392JNL	
R9	Carbon film	3.9k	RD¼PS 392JNL	
R10	Carbon film	3.9k	RD¼PS 392JNL	
R11	Carbon film	6.8k	RD¼PS 682JNL	
R12	Carbon film	6.8k	RD¼PS 682JNL	
R13	Carbon film	22k	RD¼PS 223JNL	
R14	Carbon film	22k	RD¼PS 223JNL	
R15	Carbon film	130k	RD¼PS 134JNL	

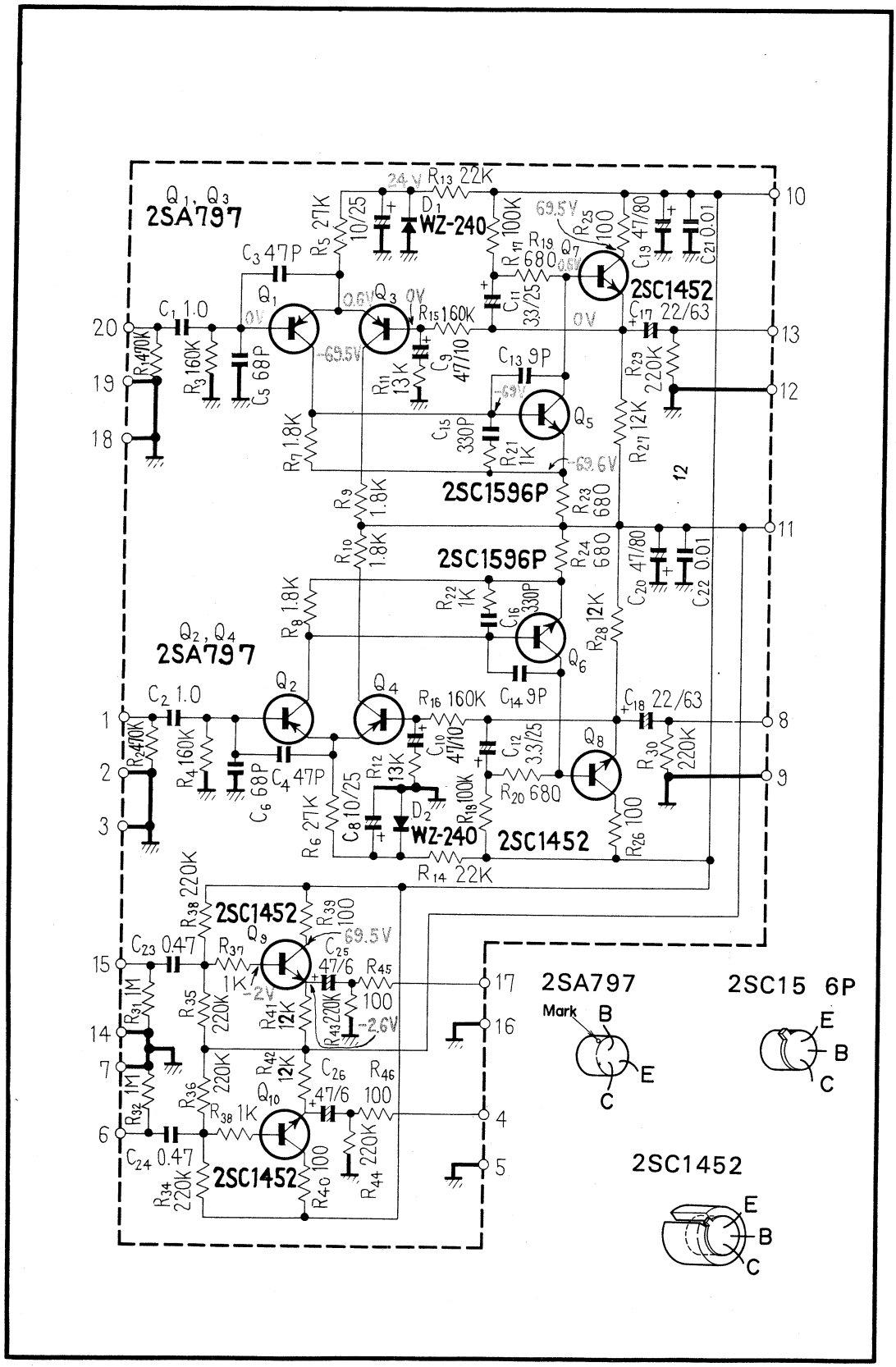
Symbol	Description			Part No.	
R16	Carbon film	130k		RD¼PS 134JNL	
R17	Carbon film	75k		RD¼PS 753JNL	
R18	Carbon film	75k		RD¼PS 753JNL	
R19	Carbon film	33k		RD¼PS 333JNL	
R20	Carbon film	33k		RD¼PS 333JNL	
R21	Carbon film	1k		RD¼PS 102JNL	
R22	Carbon film	1k		RD¼PS 102JNL	
R23	Carbon film	680		RD¼PS 681JNL	
R24	Carbon film	680		RD¼PS 681JNL	
R25	Carbon film	100		RD¼PS 101JNL	
R26	Carbon film	100		RD¼PS 101JNL	
R27	Metal oxide	12k	1W	RS1P 123J	
R28	Metal oxide	12k	1W	RS1P 123J	
R29	Carbon film	220k		RD¼PS 224JNL	
R30	Carbon film	220k		RD¼PS 224JNL	
R31	Carbon film	1M		RD¼PS 105JNL	
R32	Carbon film	1M		RD¼PS 105JNL	
R33	Carbon film	220k		RD¼PS 224JNL	
R34	Carbon film	220k		RD¼PS 224JNL	
R35	Carbon film	220k		RD¼PS 224JNL	
R36	Carbon film	220k		RD¼PS 224JNL	
R37	Carbon film	1k		RD¼PS 102JNL	
R38	Carbon film	1k		RD¼PS 102JNL	
R39	Carbon film	100		RD¼PS 101JNL	
R40	Carbon film	100		RD¼PS 101JNL	
R41	Metal oxide	6.8k	1W	RS1P 682J	
R42	Metal oxide	6.8k	1W	RS1P 682J	
R43	Carbon film	220k		RD¼PS 224JNL	
R44	Carbon film	220k		RD¼PS 224JNL	
R45	Carbon film	1.5k		RD¼PS 152JNL	
R46	Carbon film	1.5k		RD¼PS 152JNL	
R47	Carbon film	2.2k		RD¼PS 222JNL	
R48	Carbon film	2.2k		RD¼PS 222JNL	
R49	Carbon film	130k		RD¼PS 134JNL	
R50	Carbon film	130k		RD¼PS 134JNL	

SEMICONDUCTORS, OTHERS

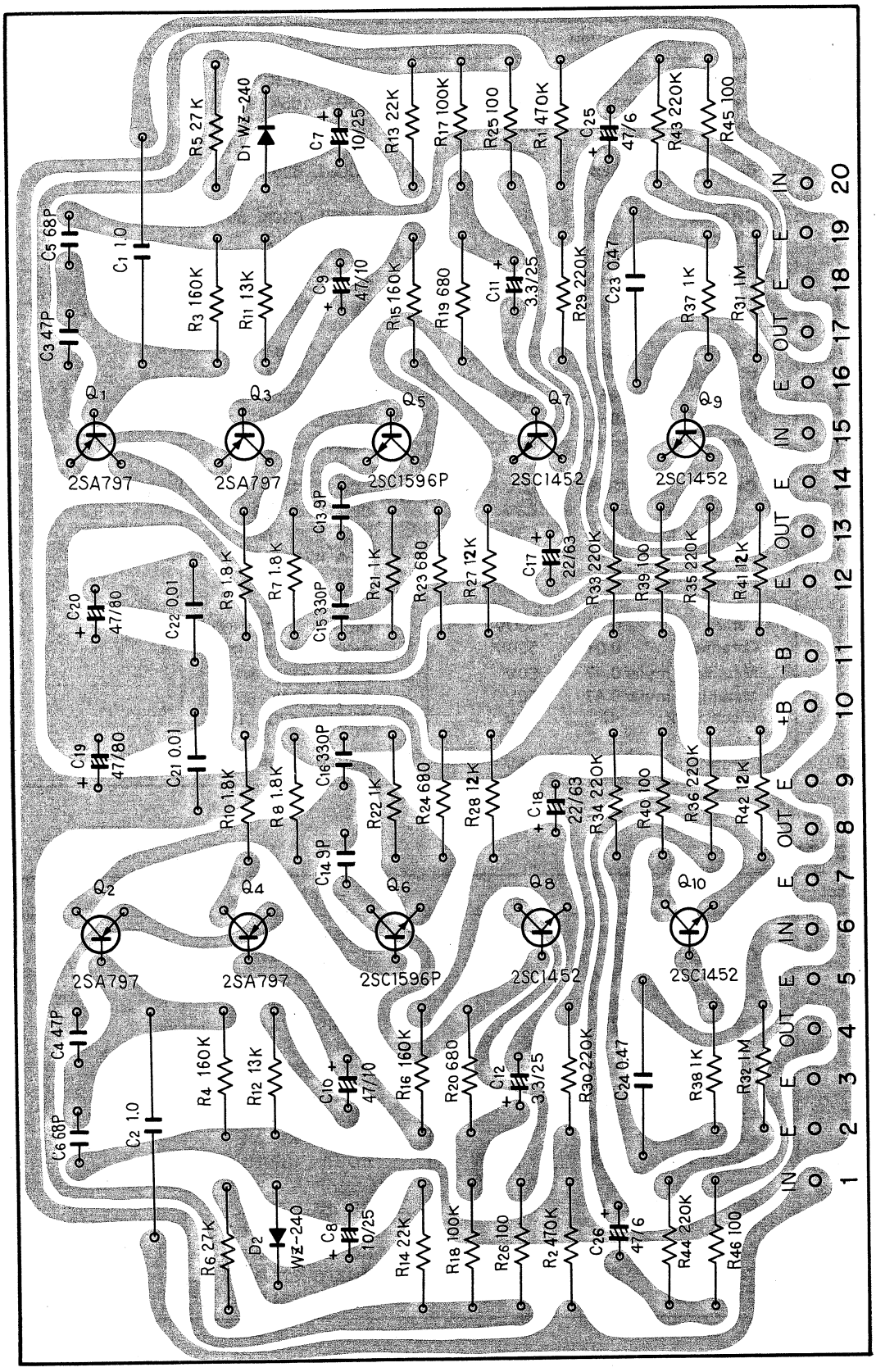
Symbol	Description		Part No.	
Q1	Transistor	2SA797-F or G		
Q2	Transistor	2SA797-F or G		
Q3	Transistor	2SA797-F or G		
Q4	Transistor	2SA797-F or G		
Q5	Transistor	2SC1596P-S		
Q6	Transistor	2SC1596P-S		
Q7	Transistor	2SC1452-V		
Q8	Transistor	2SC1452-V		
Q9	Transistor	2SC1452-V		
Q10	Transistor	2SC1452-V		
D1	Zener diode	WZ-240		
D2	Zener diode	WZ-240		
	Heat sink		ANH-180-0	

Flat amplifier assembly

12.4 FLAT AMPLIFIER-B ASSEMBLY (AWG-028-0)



Foil side (AWG-028-0)



Parts List of Flat Amplifier-B Assembly (AWG-028-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Metallized mylar	1	50V	CQEA 105K 50	
C2	Metallized mylar	1	50V	CQEA 105K 50	
C3	Ceramic	47p	50V	CCDSL 470K 50	
C4	Ceramic	47p	50V	CCDSL 470K 50	
C5	Ceramic	68p	50V	CCDSL 680K 50	
C6	Ceramic	68p	50V	CCDSL 680K 50	
C7	Electrolytic	10	25V	CEA 100P 25	
C8	Electrolytic	10	25V	CEA 100P 25	
C9	Electrolytic	47	10V	CEA 470P 10	
C10	Electrolytic	47	10V	CEA 470P 10	
C11	Electrolytic	3.3	25V	CSZA 3R3M 25	
C12	Electrolytic	3.3	25V	CSZA 3R3M 25	
C13	Ceramic	9p	50V	CCDSL 090K 50	
C14	Ceramic	9p	50V	CCDSL 090K 50	
C15	Ceramic	330p	50V	CCDSL 331K 50	
C16	Ceramic	330p	50V	CCDSL 331K 50	
C17	Electrolytic	22	63V	CEA 220P 63	
C18	Electrolytic	22	63V	CEA 220P 63	
C19	Electrolytic	47	80V	CEA 470P 80	
C20	Electrolytic	47	80V	CEA 470P 80	
C21	Ceramic	0.01	500V	CKDYF 103Z 500	
C22	Ceramic	0.01	500V	CKDYF 103Z 500	
C23	Metallized mylar	0.47	50V	CQEA 474K 50	
C24	Metallized mylar	0.47	50V	CQEA 474K 50	
C25	Electrolytic	47	16V	CEANL 470P 16	
C26	Electrolytic	47	16V	CEANL 470P 16	

RESISTORS

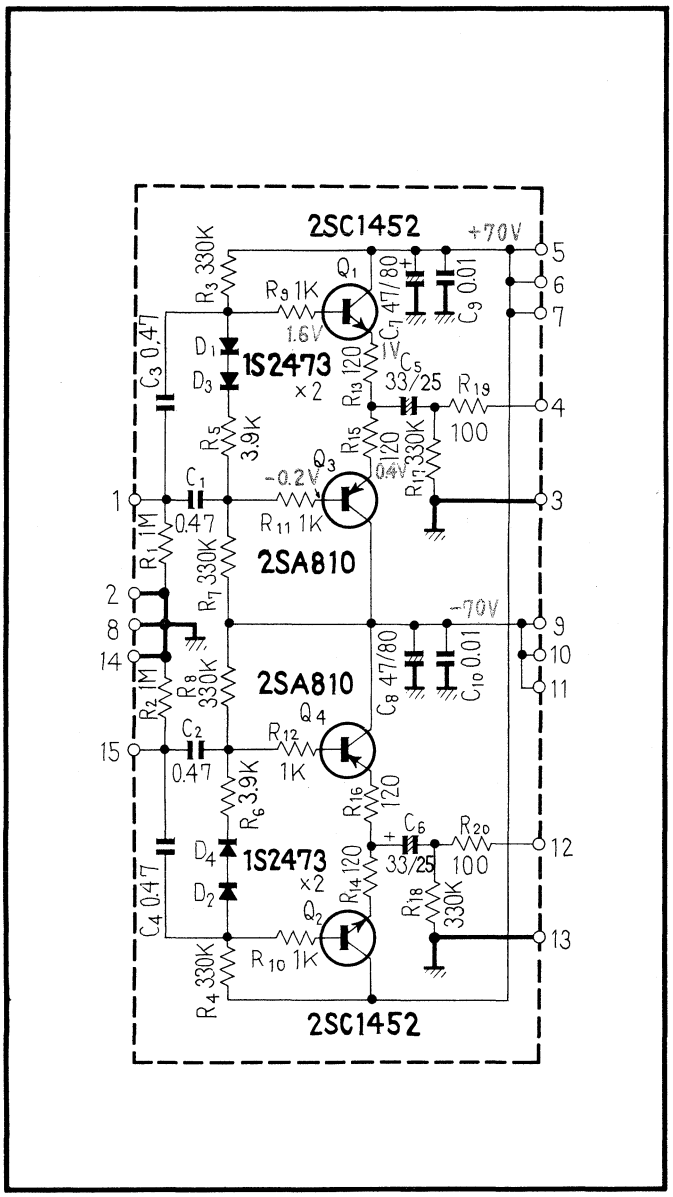
Symbol	Description		Part No.	
R1	Carbon film	470k	RD¼PS 474JNL	
R2	Carbon film	470k	RD¼PS 474JNL	
R3	Carbon film	160k	RD¼PS 164JNL	
R4	Carbon film	160k	RD¼PS 164JNL	
R5	Carbon film	27k	RD¼PS 273JNL	
R6	Carbon film	27k	RD¼PS 273JNL	
R7	Carbon film	1.8k	RD¼PS 182JNL	
R8	Carbon film	1.8k	RD¼PS 182JNL	
R9	Carbon film	1.8k	RD¼PS 182JNL	
R10	Carbon film	1.8k	RD¼PS 182JNL	
R11	Carbon film	13k	RD¼PS 133JNL	
R12	Carbon film	13k	RD¼PS 133JNL	
R13	Carbon film	22k	RD¼PS 223JNL	
R14	Carbon film	22k	RD¼PS 223JNL	
R15	Carbon film	160k	RD¼PS 164JNL	

Symbol	Description			Part No.	
R16	Carbon film	470k		RD¼PS 474JNL	
R17	Carbon film	100k		RD¼PS 104JNL	
R18	Carbon film	100k		RD¼PS 104JNL	
R19	Carbon film	680		RD¼PS 681JNL	
R20	Carbon film	680		RD¼PS 681JNL	
R21	Carbon film	1k		RD¼PS 102JNL	
R22	Carbon film	1k		RD¼PS 102JNL	
R23	Carbon film	680		RD¼PS 681JNL	
R24	Carbon film	680		RD¼PS 681JNL	
R25	Carbon film	100		RD¼PS 101JNL	
R26	Carbon film	100		RD¼PS 101JNL	
R27	Metal oxide	12k	1W	PS1P 123J	
R28	Metal oxide	12k	1W	PS1P 123J	
R29	Carbon film	220k		RD¼PS 224JNL	
R30	Carbon film	220k		RD¼PS 224JNL	
R31	Carbon film	1M		RD¼PS 105JNL	
R32	Carbon film	1M		RD¼PS 105JNL	
R33	Carbon film	220k		RD¼PS 224JNL	
R34	Carbon film	220k		RD¼PS 224JNL	
R35	Carbon film	220k		RD¼PS 224JNL	
R36	Carbon film	220k		RD¼PS 224JNL	
R37	Carbon film	1k		RD¼PS 102JNL	
R38	Carbon film	1k		RD¼PS 102JNL	
R39	Carbon film	100		RD¼PS 101JNL	
R40	Carbon film	100		RD¼PS 101JNL	
R41	Metal oxide	12k	1W	PS1P 123J	
R42	Metal oxide	12k	1W	PS1P 123J	
R43	Carbon film	220k		RD¼PS 224JNL	
R44	Carbon film	220k		RD¼PS 224JNL	
R45	Carbon film	100		RD¼PS 101JNL	
R46	Carbon film	100		RD¼PS 101JNL	

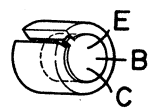
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SA797-F or G		
Q2	Transistor	2SA797-F or G		
Q3	Transistor	2SA797-F or G		
Q4	Transistor	2SA797-F or G		
Q5	Transistor	2SC1596P-S		
Q6	Transistor	2SC1596P-S		
Q7	Transistor	2SC1452-B, G or V		
Q8	Transistor	2SC1452-B, G or V		
Q9	Transistor	2SC1452-B, G or V		
G10	Transistor	2SC1452-B, G or V		
D1	Zener diode	WZ-240		
D2	Zener diode	WZ-240		

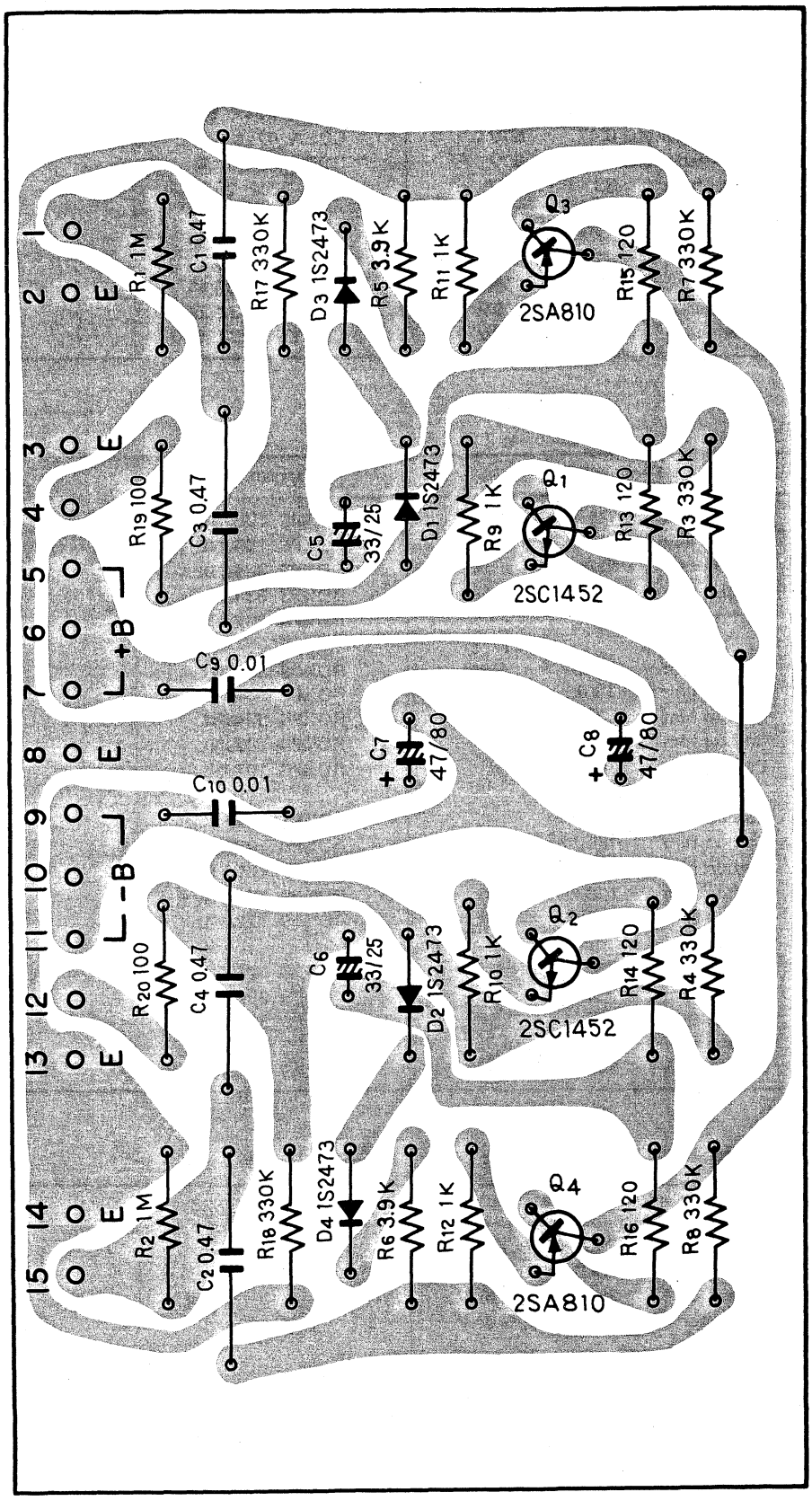
12.5 BUFFER AMPLIFIER ASSEMBLY (AWM-052-0)



2SC1452
2SA810



Foil side (AWM-052-0)



Parts List of Buffer Amplifier Assembly (AWM-052-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Metallized mylar	0.47	50V	CQEA 474K 50	
C2	Metallized mylar	0.47	50V	CQEA 474K 50	
C3	Metallized mylar	0.47	50V	CQEA 474K 50	
C4	Metallized mylar	0.47	50V	CQEA 474K 50	
C5	Electrolytic	33	25V	CEA 330P 25 NP	
C6	Electrolytic	33	25V	CEA 330P 25 NP	
C7	Electrolytic	47	80V	CEA 470P 80	
C8	Electrolytic	47	80V	CEA 470P 80	
C9	Ceramic	0.01	500V	CKDYF 103Z 500	
C10	Ceramic	0.01	500V	CKDYF 103Z 500	

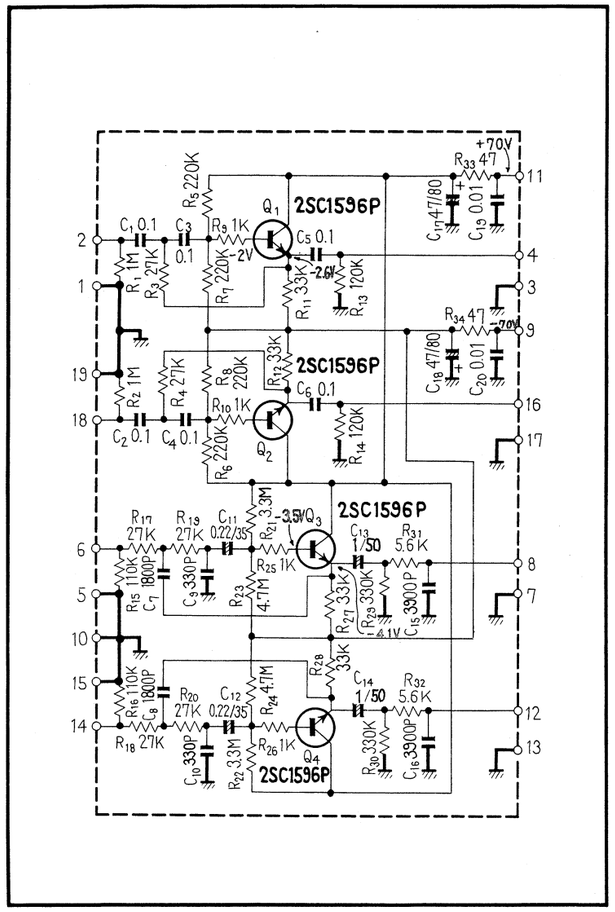
RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	1M	RD¼PS 105JNL	
R2	Carbon film	1M	RD¼PS 105JNL	
R3	Carbon film	330k	RD¼PS 334JNL	
R4	Carbon film	330k	RD¼PS 334JNL	
R5	Carbon film	3.9k	RD¼PS 392JNL	
R6	Carbon film	3.9k	RD¼PS 392JNL	
R7	Carbon film	330k	RD¼PS 334JNL	
R8	Carbon film	330k	RD¼PS 334JNL	
R9	Carbon film	1k	RD¼PS 102JNL	
R10	Carbon film	1k	RD¼PS 102JNL	
R11	Carbon film	1k	RD¼PS 102JNL	
R12	Carbon film	1k	RD¼PS 102JNL	
R13	Carbon film	120	RD¼PS 121JNL	
R14	Carbon film	120	RD¼PS 121JNL	
R15	Carbon film	120	RD¼PS 121JNL	
R16	Carbon film	120	RD¼PS 121JNL	
R17	Carbon film	330k	RD¼PS 334JNL	
R18	Carbon film	330k	RD¼PS 334JNL	
R19	Carbon film	100	RD¼PS 101JNL	
R20	Carbon film	100	RD¼PS 101JNL	

SEMICONDUCTORS

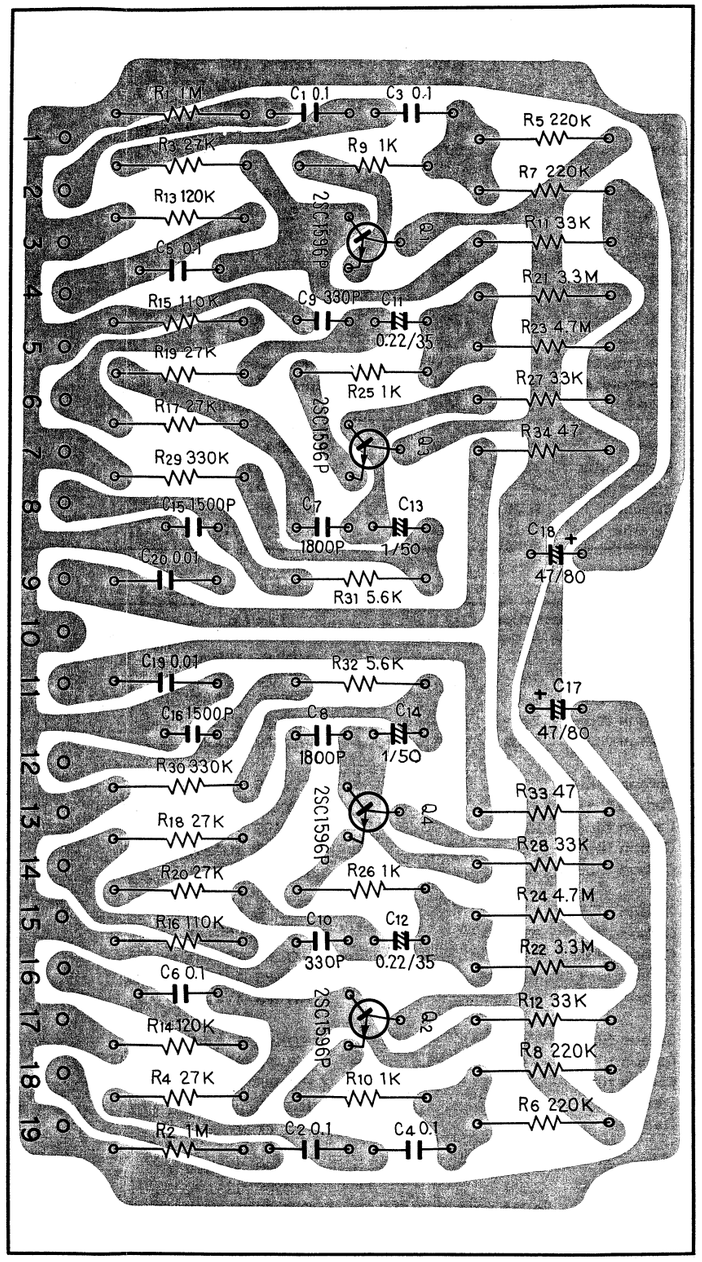
Symbol	Description		Part No.	
Q1	Transistor	2SC1452-B, G or V		
Q2	Transistor	2SC1452-B, G or V		
Q3	Transistor	2SA810-B, G or V		
Q4	Transistor	2SA810-B, G or V		
D1	Diode	1S2473		
D2	Diode	1S2473		
D3	Diode	1S2473		
D4	Diode	1S2473		

12.6 FILTER AMPLIFIER ASSEMBLY (AWM-053-A)



2SC1596P

Foil side (AWM-053-A)



Parts List of Filter Amplifier Assembly (AWM-053-A)

CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.1	50V	CQMA 104J 50R	
C2	Mylar	0.1	50V	CQMA 104J 50R	
C3	Mylar	0.1	50V	CQMA 104J 50R	
C4	Mylar	0.1	50V	CQMA 104J 50R	
C5	Mylar	0.1	50V	CQMA 104J 50R	
C6	Mylar	0.1	50V	CQMA 104J 50R	
C7	Styrol	1800p	50V	CQSA 182J 50	
C8	Styrol	1800p	50V	CQSA 182J 50	
C9	Styrol	330p	50V	CQSA 331J 50	
C10	Styrol	330p	50V	CQSA 331J 50	
C11	Electrolytic	0.22	35V	ACH-304-0	
C12	Electrolytic	0.22	35V	ACH-304-0	
C13	Electrolytic	1	50V	ACH-305-0	
C14	Electrolytic	1	50V	ACH-305-0	
C15	Styrol	3900p	50V	CQSA 392J 50	
C16	Styrol	3900p	50V	CQSA 392J 50	
C17	Electrolytic	47	80V	CEA 470P 80	
C18	Electrolytic	47	80V	CEA 470P 80	
C19	Ceramic	0.01	500V	CKDYF 103Z 500	
C20	Ceramic	0.01	500V	CKDYF 103Z 500	

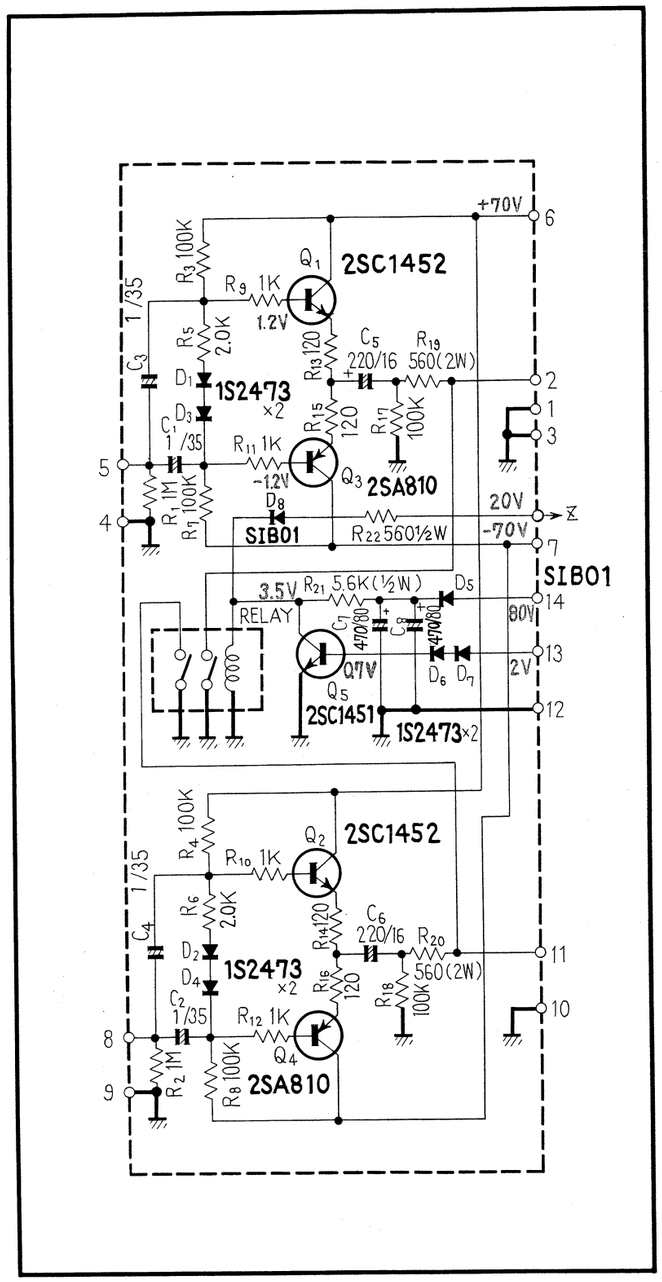
RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	1M	RD¼PS 105JNL	
R2	Carbon film	1M	RD¼PS 105JNL	
R3	Carbon film	27k	RD¼PS 273JNL	
R4	Carbon film	27k	RD¼PS 273JNL	
R5	Carbon film	220k	RD¼PS 224JNL	
R6	Carbon film	220k	RD¼PS 224JNL	
R7	Carbon film	220k	RD¼PS 224JNL	
R8	Carbon film	220k	RD¼PS 224JNL	
R9	Carbon film	1k	RD¼PS 102JNL	
R10	Carbon film	1k	RD¼PS 102JNL	
R11	Carbon film	33k	RD¼PS 333JNL	
R12	Carbon film	33k	RD¼PS 333JNL	
R13	Carbon film	180k	RD¼PS 184JNL	
R14	Carbon film	180k	RD¼PS 184JNL	
R15	Carbon film	110k	RD¼PS 114JNL	
R16	Carbon film	110k	RD¼PS 114JNL	
R17	Carbon film	27k	RD¼PS 273JNL	
R18	Carbon film	27k	RD¼PS 273JNL	
R19	Carbon film	27k	RD¼PS 273JNL	
R20	Carbon film	27k	RD¼PS 273JNL	
R21	Carbon film	3.3M	RD¼PS 335JNL	
R22	Carbon film	3.3M	RD¼PS 335JNL	
R23	Carbon film	4.7M	RD¼PS 475JNL	
R24	Carbon film	4.7M	RD¼PS 475JNL	
R25	Carbon film	1k	RD¼PS 102JNL	
R26	Carbon film	1k	RD¼PS 102JNL	
R27	Carbon film	33k	RD¼PS 333JNL	
R28	Carbon film	33k	RD¼PS 333JNL	
R29	Carbon film	330k	RD¼PS 334JNL	
R30	Carbon film	330k	RD¼PS 334JNL	
R31	Carbon film	5.6k	RD¼PS 562JNL	
R32	Carbon film	5.6k	RD¼PS 562JNL	
R33	Carbon film	47	RD¼PS 470JNL	
R34	Carbon film	47	RD¼PS 470JNL	

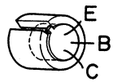
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SC1596P-S		
Q2	Transistor	2SC1596P-S		
Q3	Transistor	2SC1596P-S		
Q4	Transistor	2SC1596P-S		

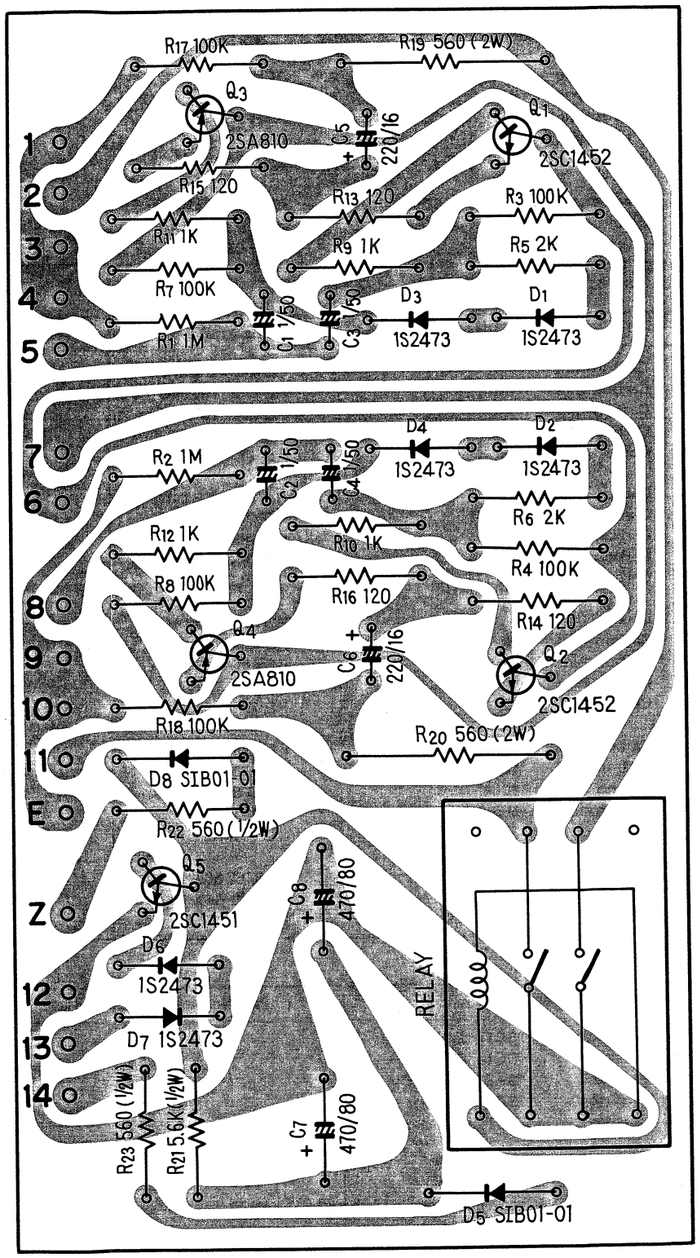
12.7 MUTING-BUFFER AMPLIFIER ASSEMBLY (AWM-054-B)



2SA810
2SC1451
2SC1452



Foil side (AWM-054-B)



Parts List of Muting-Buffer Amplifier Assembly (AWM-054-B)

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	1	35V	ACH-305-0	
C2	Electrolytic	1	35V	ACH-305-0	
C3	Electrolytic	1	35V	ACH-305-0	
C4	Electrolytic	1	35V	ACH-305-0	
C5	Electrolytic	220	16V	CEA 221P 16	
C6	Electrolytic	220	16V	CEA 221P 16	
C7	Electrolytic	470	80V	ACH-038-0	
C8	Electrolytic	470	80V	ACH-038-0	

RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	1M		RD¼PS 105JNL	
R2	Carbon film	1M		RD¼PS 105JNL	
R3	Carbon film	100k		RD¼PS 104JNL	
R4	Carbon film	100k		RD¼PS 104JNL	
R5	Carbon film	2k		RD¼PS 202JNL	
R6	Carbon film	2k		RD¼PS 202JNL	
R7	Carbon film	100k		RD¼PS 104JNL	
R8	Carbon film	100k		RD¼PS 104JNL	
R9	Carbon film	1k		RD¼PS 102JNL	
R10	Carbon film	1k		RD¼PS 102JNL	
R11	Carbon film	1k		RD¼PS 102JNL	
R12	Carbon film	1k		RD¼PS 102JNL	
R13	Carbon film	120		RD¼PS 121JNL	
R14	Carbon film	120		RD¼PS 121JNL	
R15	Carbon film	120		RD¼PS 121JNL	
R16	Carbon film	120		RD¼PS 121JNL	
R17	Carbon film	100k		RD¼PS 104JNL	
R18	Carbon film	100k		RD¼PS 104JNL	
R19	Metal oxide	560	2W	RS2P 561J	
R20	Metal oxide	560	2W	RS2P 561J	
R21	Carbon film	5.6k	½W	RD½PS 562J	
R22	Carbon film	560	½W	RD½PS 561J	
R23	Carbon film	560	½W	RD½PS 561J	

SEMICONDUCTORS

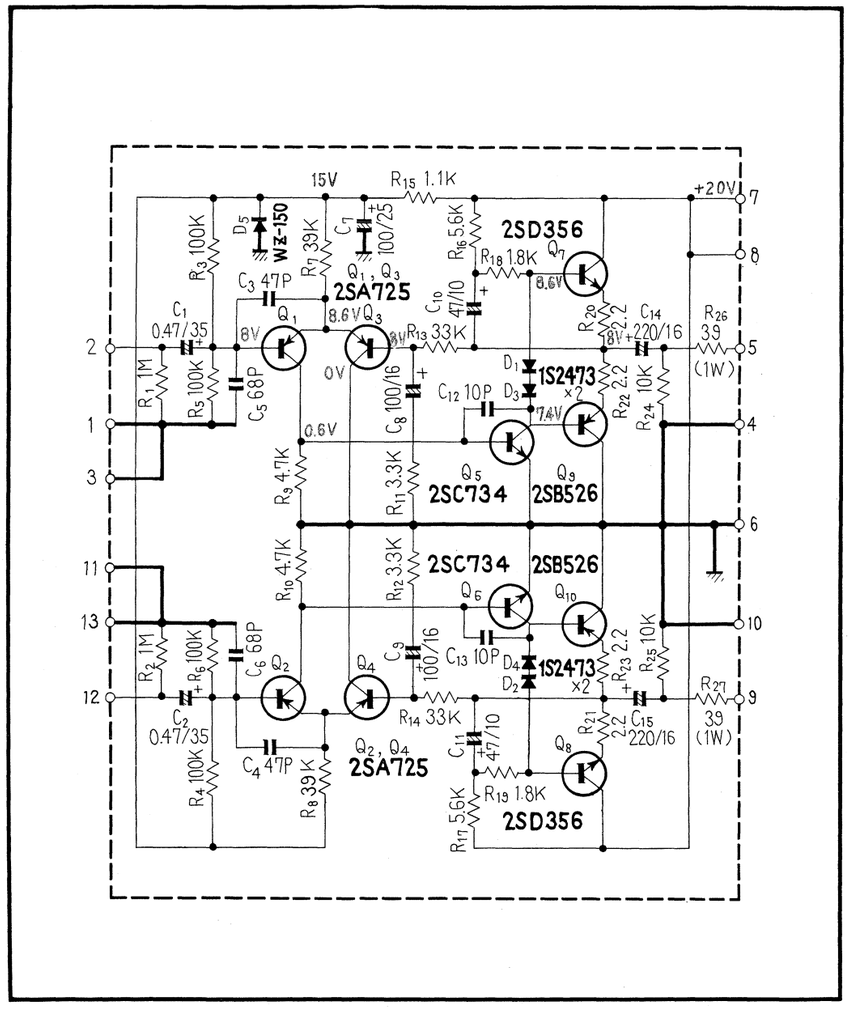
Symbol	Description		Part No.	
Q1	Transistor	2SC1452-B, G or V		
Q2	Transistor	2SC1452-B, G or V		
Q3	Transistor	2SA810-B, G or V		
Q4	Transistor	2SA810-B, G or V		
Q5	Transistor	2SC1451-B, G or V		
D1	Diode	1S2743		
D2	Diode	1S2473		
D3	Diode	1S2473		
D4	Diode	1S2473		
D5	Diode	SIB01-04		
D6	Diode	1S2473		
D7	Diode	1S2473		
D8	Diode	SIB01-01		

OTHERS

Symbol	Description	Part No.	
	Lead relay	ASR-004-A	
	Heat sink	ANH-180-0	

Muting buffer amplifier assembly

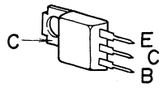
12.8 HEADPHONE AMPLIFIER ASSEMBLY (AWM-055-A)



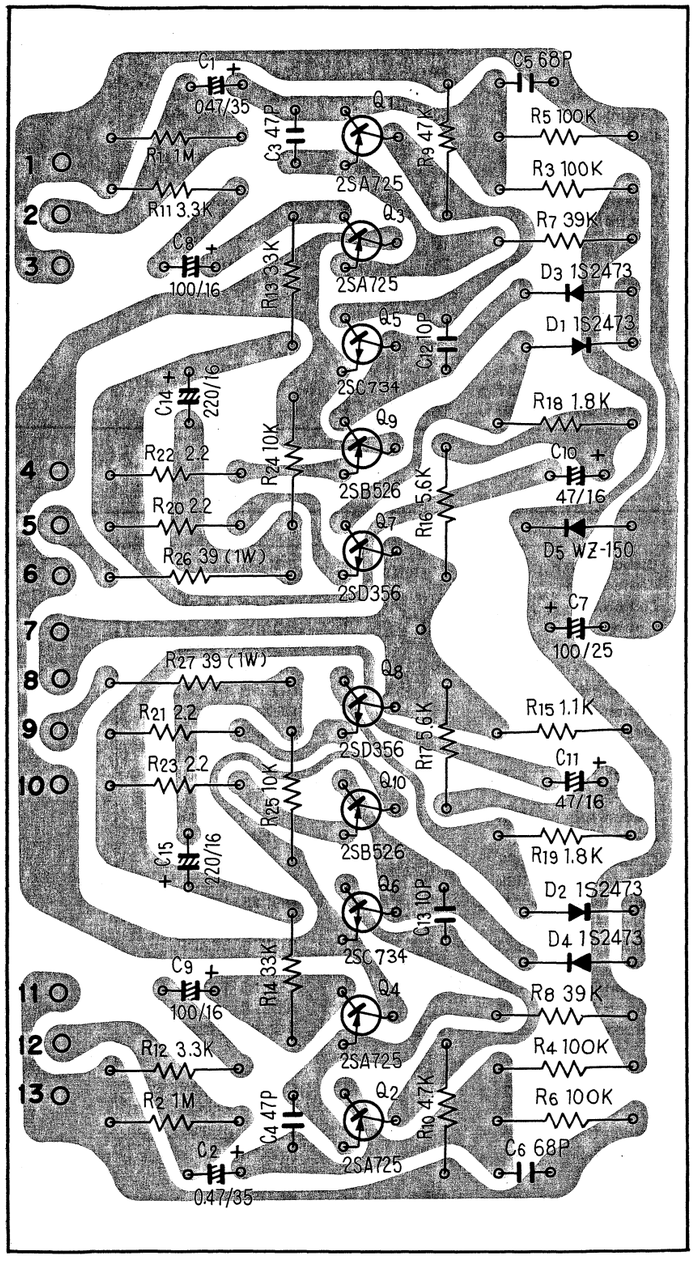
2SA725

2SC734

2SB526
2SD356



Foil side (AWM-055-A)



Parts List of Headphone Amplifier Assembly (AWM-055-A)

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	0.47	35V	CSZA R47M 35	
C2	Electrolytic	0.47	35V	CSZA R47M 35	
C3	Ceramic	47p	50V	CCDSL 470K 50	
C4	Ceramic	47p	50V	CCDSL 470K 50	
C5	Ceramic	68p	50V	CCDSL 680K 50	
C6	Ceramic	68p	50V	CCDSL 680K 50	
C7	Electrolytic	100	25V	CEA 101P 25	
C8	Electrolytic	100	16V	CEA 101P 16	
C9	Electrolytic	100	16V	CEA 101P 16	
C10	Electrolytic	47	10V	CEA 470P 10	
C11	Electrolytic	47	10V	CEA 470P 10	
C12	Ceramic	10p	50V	CCDSL 100K 50	
C13	Ceramic	10p	50V	CCDSL 100K 50	
C14	Electrolytic	220	16V	CEA 221P 16	
C15	Electrolytic	220	16V	CEA 221P 16	

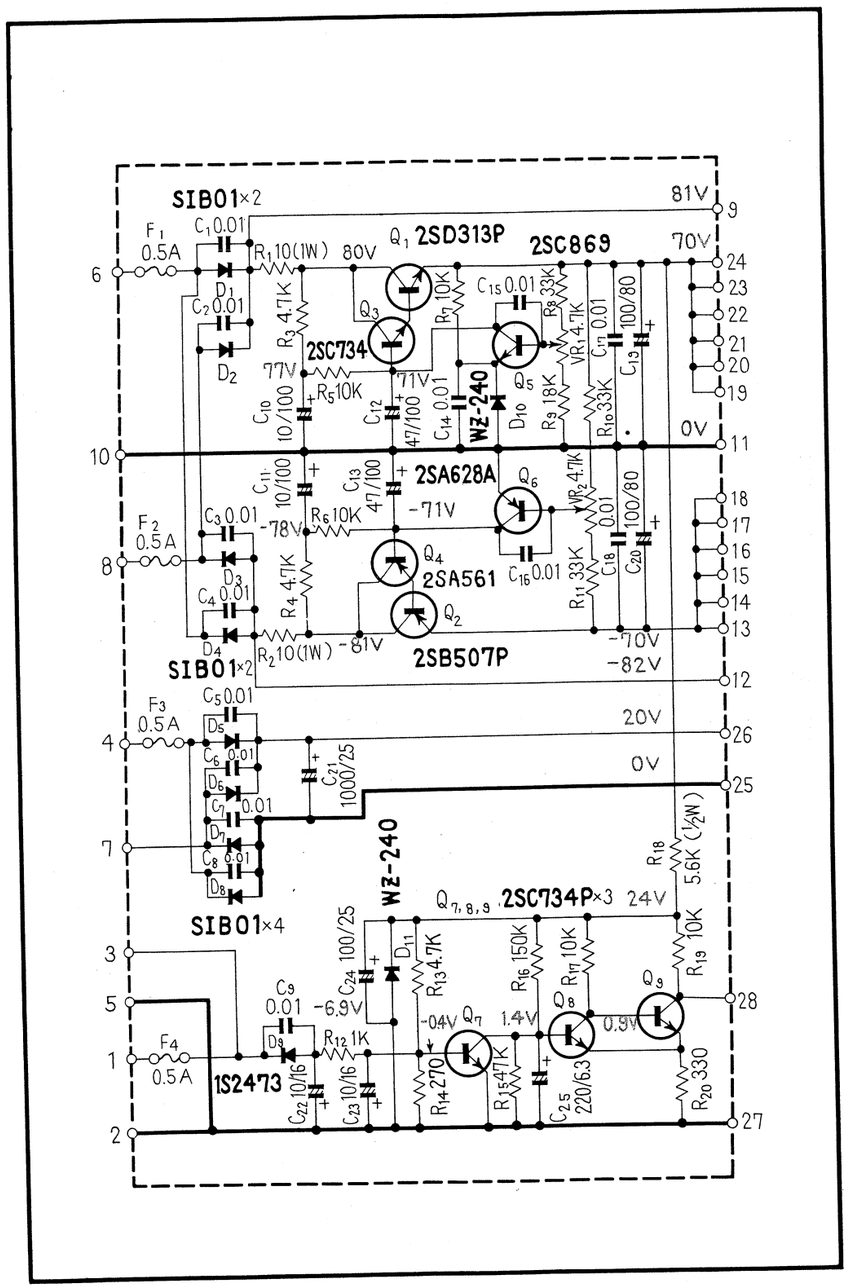
RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	1M		RD¼PS 105JNL	
R2	Carbon film	1M		RD¼PS 105JNL	
R3	Carbon film	100k		RD¼PS 104JNL	
R4	Carbon film	100k		RD¼PS 104JNL	
R5	Carbon film	100k		RD¼PS 104JNL	
R6	Carbon film	100k		RD¼PS 104JNL	
R7	Carbon film	39k		RD¼PS 393JNL	
R8	Carbon film	39k		RD¼PS 393JNL	
R9	Carbon film	4.7k		RD¼PS 472JNL	
R10	Carbon film	4.7k		RD¼PS 472JNL	
R11	Carbon film	3.3k		RD¼PS 332JNL	
R12	Carbon film	3.3k		RD¼PS 332JNL	
R13	Carbon film	33k		RD¼PS 333JNL	
R14	Carbon film	33k		RD¼PS 333JNL	
R15	Carbon film	1.1k		RD¼PS 112JNL	
R16	Carbon film	5.6k		RD¼PS 562JNL	
R17	Carbon film	5.6k		RD¼PS 562JNL	
R18	Carbon film	1.8k		RD¼PS 182JNL	
R19	Carbon film	1.8k		RD¼PS 182JNL	
R20	Carbon film	2.2		RD¼PS 2R2JNL	
R21	Carbon film	2.2		RD¼PS 2R2JNL	
R22	Carbon film	2.2		RD¼PS 2R2JNL	
R23	Carbon film	2.2		RD¼PS 2R2JNL	
R24	Carbon film	10k		RD¼PS 103JNL	
R25	Carbon film	10k		RD¼PS 103JNL	
R26	Metal oxide	39	1W	RS1P 390J	
R27	Metal oxide	39	1W	RS1P 390J	

SEMICONDUCTORS

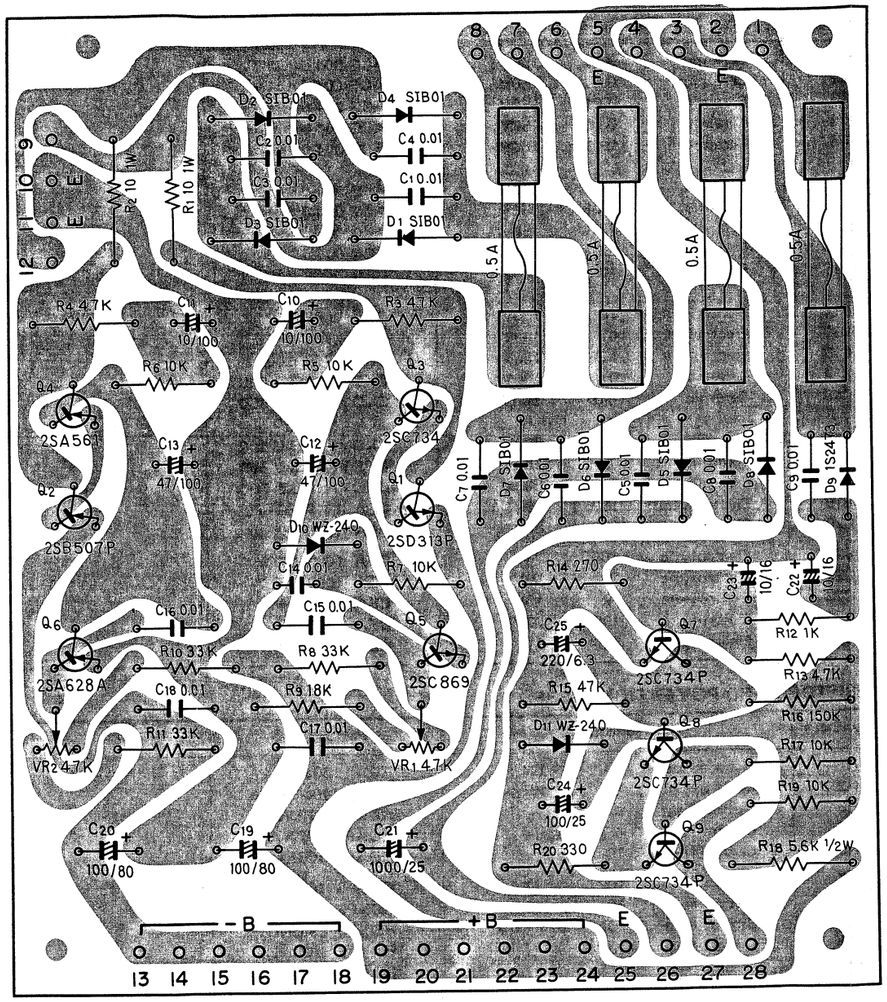
Symbol	Description		Part No.	
Q1	Transistor	2SA725-F,G		
Q2	Transistor	2SA725-F,G		
Q3	Transistor	2SA725-F,G		
Q4	Transistor	2SA725-F,G		
Q5	Transistor	2SC734-Y ,GR,O		
Q6	Transistor	2SC734-Y ,GR,O		
Q7	Transistor	2SD356-D		
Q8	Transistor	2SD356-D		
Q9	Transistor	2SB526-C,D		
Q10	Transistor	2SB526-C,D		
D1	Diode	1S2473		
D2	Diode	1S2473		
D3	Diode	1S2473		
D4	Diode	1S2473		
D5	Zener diode	WZ-150		

12.9 POWER SUPPLY ASSEMBLY (AWR-048-0)



59

Foil side (AWR-048-0)



2SD313P
2SB507P

2SC734
2SA561

2SA628A

2SC869

60

Parts List of Power Supply Circuit Assembly (AWR-048-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	150V	ACG-004-0	
C2	Ceramic	0.01	150V	ACG-004-0	
C3	Ceramic	0.01	150V	ACG-004-0	
C4	Ceramic	0.01	150V	ACG-004-0	
C5	Ceramic	0.01	150V	ACG-004-0	
C6	Ceramic	0.01	150V	ACG-004-0	
C7	Ceramic	0.01	150V	ACG-004-0	
C8	Ceramic	0.01	150V	ACG-004-0	
C9	Ceramic	0.01	150V	ACG-004-0	
C10	Electrolytic	10	100V	CEA 100P 100	
C11	Electrolytic	10	100V	CEA 100P 100	
C12	Electrolytic	47	100V	CEA 470P 100	
C13	Electrolytic	47	100V	CEA 470P 100	
C14	Ceramic	0.01	500V	CKDYF 103Z 500	
C15	Ceramic	0.01	500V	CKDYF 103Z 500	
C16	Ceramic	0.01	500V	CKDYF 103Z 500	
C17	Ceramic	0.01	500V	CKDYF 103Z 500	
C18	Ceramic	0.01	500V	CKDYF 103Z 500	
C19	Electrolytic	100	80V	CEA 101P 80	
C20	Electrolytic	100	80V	CEA 101P 80	
C21	Electrolytic	1000	25V	CEA 102P 25	
C22	Electrolytic	10	16V	CEA 100P 16	
C23	Electrolytic	10	16V	CEA 100P 16	
C24	Electrolytic	100	25V	CEA 101P 25	
C25	Electrolytic	220	6V	CEA 221P 6	

RESISTORS AND POTENTIOMETERS

Symbol	Description			Part No.	
R1	Metal oxide	10	1W	RS1P 100J	
R2	Metal oxide	10	1W	RS1P 100J	
R3	Carbon film	4.7k		RD¼PS 472JNL	
R4	Carbon film	4.7k		RD¼PS 472JNL	
R5	Carbon film	10k		RD¼PS 103JNL	
R6	Carbon film	10k		RD¼PS 103JNL	
R7	Carbon film	10k		RD¼PS 103JNL	
R8	Carbon film	33k		RD¼PS 333JNL	
R9	Carbon film	18k		RD¼PS 183JNL	
R10	Carbon film	33k		RD¼PS 333JNL	
R11	Carbon film	33k		RD¼PS 333JNL	
R12	Carbon film	1k		RD¼PS 102JNL	
R13	Carbon film	4.7k		RD¼PS 472JNL	
R14	Carbon film	270		RD¼PS 271JNL	
R15	Carbon film	47k		RD¼PS 473JNL	
R16	Carbon film	150k		RD¼PS 154JNL	
R17	Carbon film	10k		RD¼PS 103JNL	
R18	Carbon film	5.6k	½W	RD½PS 562J	
R19	Carbon film	10k		RD¼PS 103JNL	
R20	Carbon film	330		RD¼PS 331JNL	
VR1	Variable resistor semi-fixed		4.7k-B	ACP-018-0	
VR2	Variable resistor semi-fixed		4.7k-B	ACP-018-0	

SEMICONDUCTORS

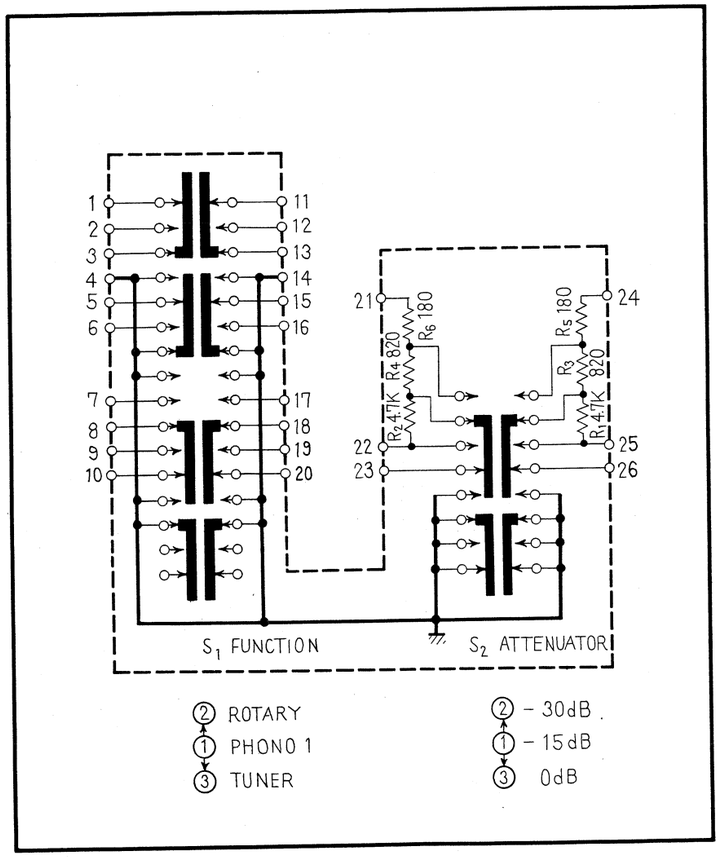
Symbol	Description		Part No.	
Q1	Transistor	2SD313P-E, D		
Q2	Transistor	2SB507P-E, D		
Q3	Transistor	2SC734-Y or O		
Q4	Transistor	2SA561-Y		
Q5	Transistor	2SC869-C or O		
Q6	Transistor	2SA628A-C or D		
Q7	Transistor	2SC734-Y or O		
Q8	Transistor	2SC734-Y or O		
Q9	Transistor	2SC734-Y or O		
D1	Diode	SIB01-04		
D2	Diode	SIB01-04		
D3	Diode	SIB01-04		
D4	Diode	SIB01-04		
D5	Diode	SIB01-01 (1S1885)		
D6	Diode	SIB01-01 (1S1885)		
D7	Diode	SIB01-01 (1S1885)		
D8	Diode	SIB01-01 (1S1885)		
D9	Diode	1S2473		
D10	Zener diode	WZ-240		
D11	Zener diode	WZ-240		

OTHERS

Symbol	Description	Part No.	
	Fuse holder (clip-in type)	K91-006-0	
F1	Fuse 0.5A	AEK-016-0	
F2	Fuse 0.5A	AEK-016-0	
F3	Fuse 0.5A	AEK-016-0	
F4	Fuse 0.5A	AEK-016-0	

Power supply assembly

12.10 SWITCH CIRCUIT-1 ASSEMBLY (AWS-055-0)



Parts List of Switch Circuit-1 Assembly (AWS-055-0)

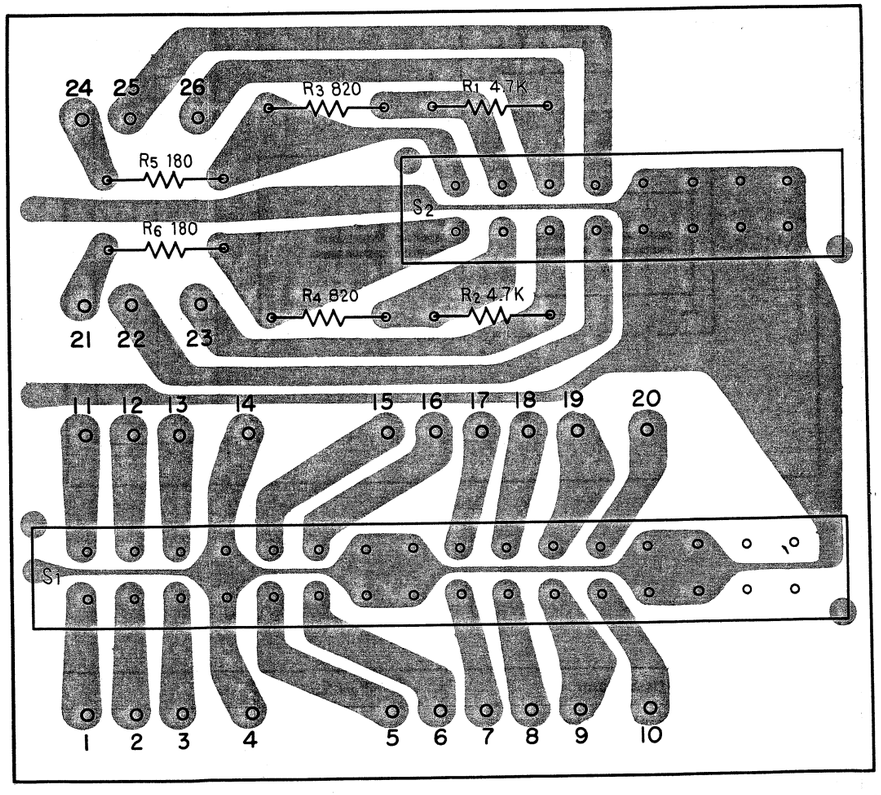
RESISTORS

Symbol	Description	Part No.	
R1	Carbon film 4.7k	RD¼PS 472JNL	
R2	Carbon film 4.7k	RD¼PS 472JNL	
R3	Carbon film 820	RD¼PS 821JNL	
R4	Carbon film 820	RD¼PS 821JNL	
R5	Carbon film 180	RD¼PS 181JNL	
R6	Carbon film 180	RD¼PS 181JNL	

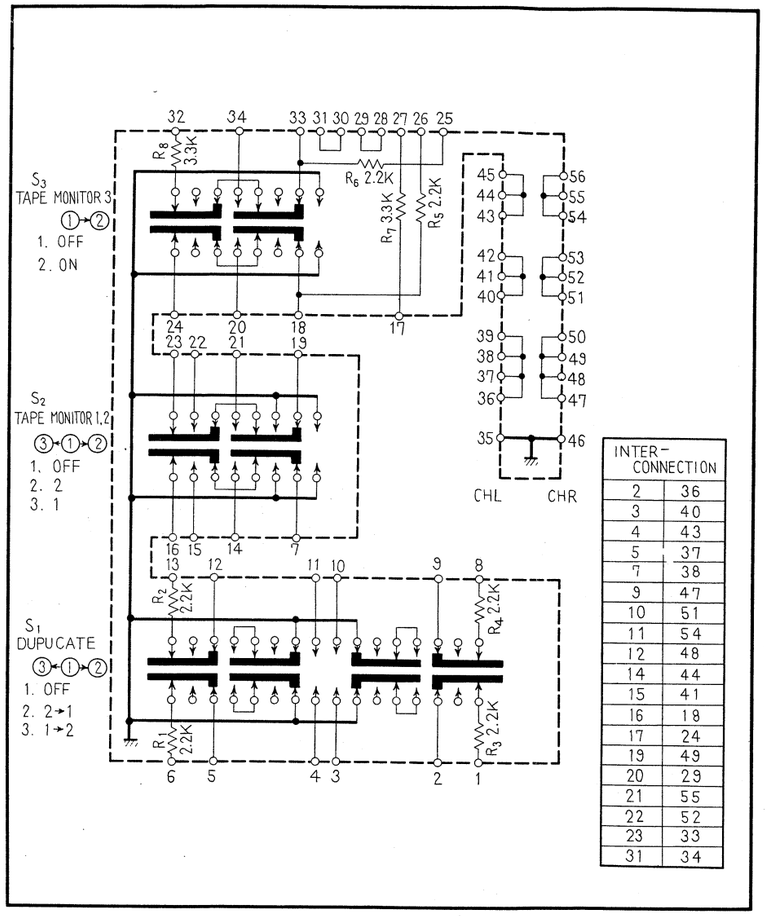
SWITCH

Symbol	Description	Part No.	
S1	Lever-switch (FUNCTION)	ASK-077-0	
S2	Lever-switch (ATTENUATOR)	ASK-075-0	

Foil side (AWS-055-0)



12.11 SWITCH CIRCUIT-2 ASSEMBLY (AWS-056-0)



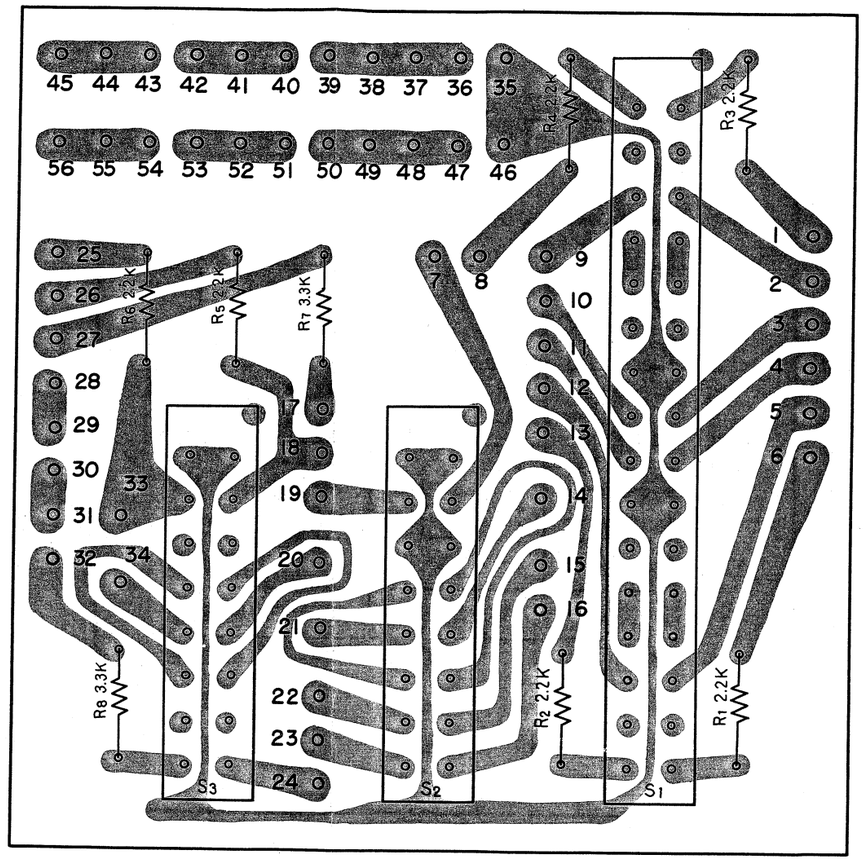
INTER-CONNECTION	
2	36
3	40
4	43
5	37
7	38
9	47
10	51
11	54
12	48
14	44
15	41
16	18
17	24
19	49
20	29
21	55
22	52
23	33
31	34

SWITCH

Symbol	Description	Part No.	
S1	Lever switch (DUPLICATE)	ASK-078-0	
S2	Lever switch (TAPE MONITOR)	ASK-076-0	
S3	Lever switch (TAPE MONITOR)	ASK-074-0	

Foil side

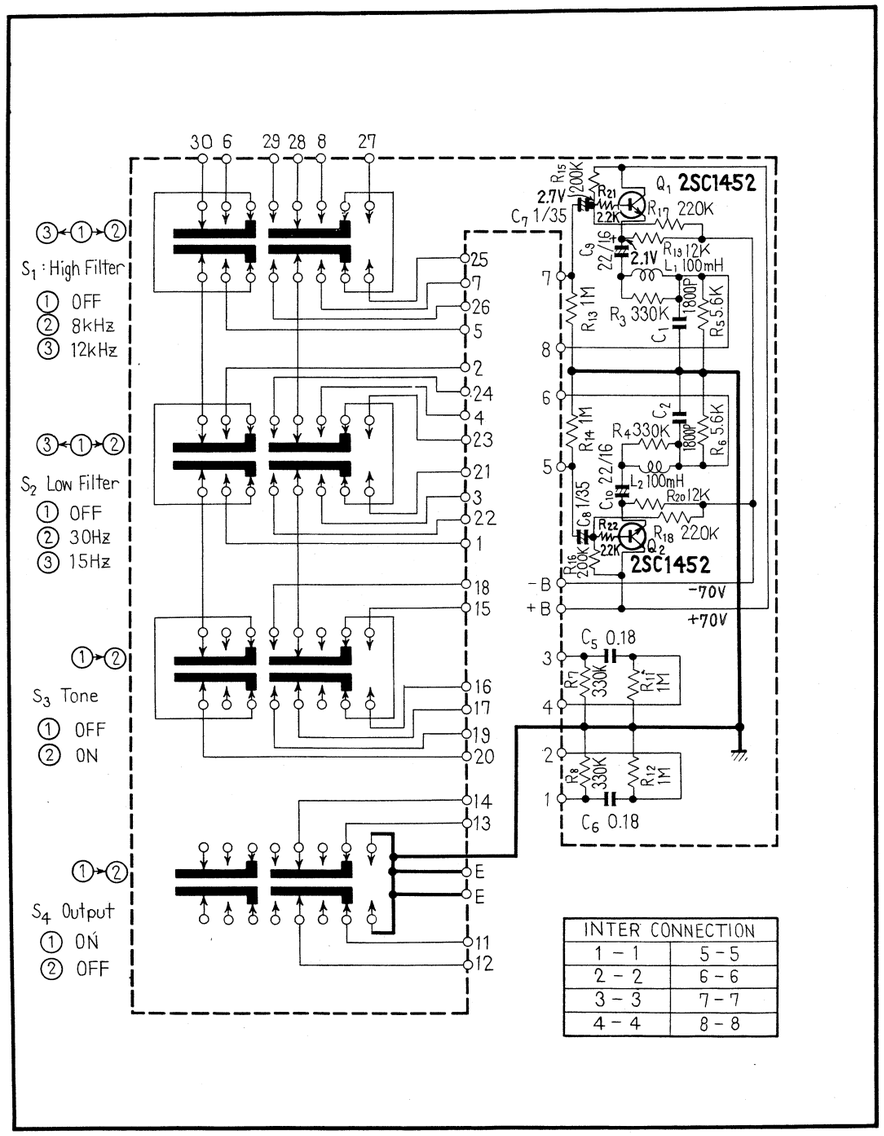
(AWS-056-0)



RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	2.2k	RD¼PS 222JNL	
R2	Carbon film	2.2k	RD¼PS 222JNL	
R3	Carbon film	2.2k	RD¼PS 222JNL	
R4	Carbon film	2.2k	RD¼PS 222JNL	
R5	Carbon film	2.2k	RD¼PS 222JNL	
R6	Carbon film	2.2k	RD¼PS 222JNL	
R7	Carbon film	3.3k	RD¼PS 332JNL	
R8	Carbon film	3.3k	RD¼PS 332JNL	

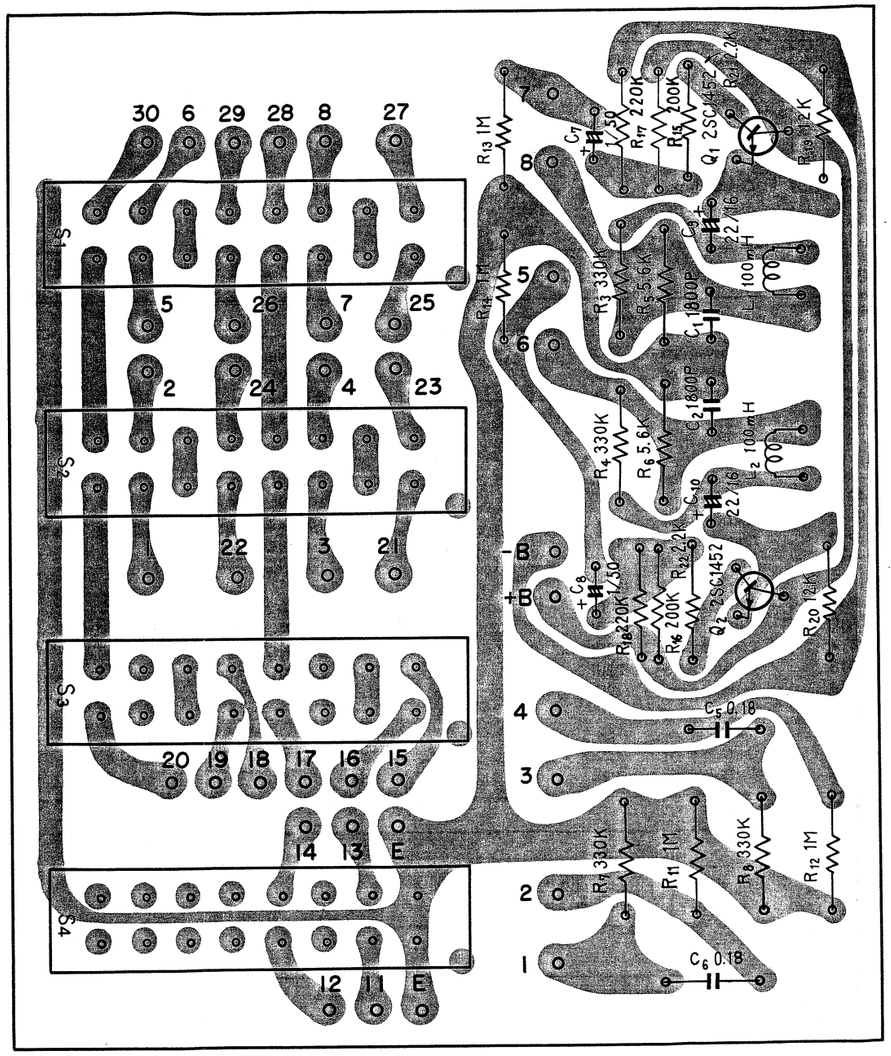
12.12 SWITCH CIRCUIT-3 ASSEMBLY (AWS-057-B)

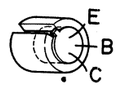


INTER CONNECTION	
1 – 1	5 – 5
2 – 2	6 – 6
3 – 3	7 – 7
4 – 4	8 – 8

Foil side

(AWS-057-B)





Parts List of Switch Circuit-3 Assembly (AWS-057-B)

CAPACITORS

Symbol	Description		Part No.	
C1	Styrol	1800p 50V	CQSA 182J 50	
C2	Styrol	1800p 50V	CQSA 182J 50	
C5	Mylar	0.18 50V	CQMA 184J 50R	
C6	Mylar	0.18 50V	CQMA 184J 50R	
C7	Electrolytic	1 35V	ACH-305-0	
C8	Electrolytic	1 35V	ACH-305-0	
C9	Electrolytic	22 16V	ACH-305-0	
C10	Electrolytic	22 16V	ACH-305-0	

RESISTORS

Symbol	Description		Part No.	
R3	Carbon film	330k	RD¼PS 334JNL	
R4	Carbon film	330	RD¼PS 334JNL	
R5	Carbon film	5.6k	RD¼PS 562JNL	
R6	Carbon film	5.6k	RD¼PS 562JNL	
R7	Carbon film	330k	RD¼PS 334JNL	
R8	Carbon film	330k	RD¼PS 334JNL	
R11	Carbon film	1M	RD¼PS 105JNL	
R12	Carbon film	1M	RD¼PS 105JNL	
R13	Carbon film	1M	RD¼PS 105JNL	
R14	Carbon film	1M	RD¼PS 105JNL	
R15	Carbon film	200k	RD¼PS 204JNL	
R16	Carbon film	200k	RD¼PS 204JNL	
R17	Carbon film	220k	RD¼PS 224JNL	
R18	Carbon film	220k	RD¼PS 224JNL	
R19	Metal oxide	12k 1W	PS1P 123J	
R20	Metal oxide	12k 1W	PS1P 123J	
R21	Carbon film	2.2k	RD¼PS 222JNL	
R22	Carbon film	2.2k	RD¼PS 222JNL	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SC1452-B, G or V		
Q2	Transistor	2SC1452-B, G or V		

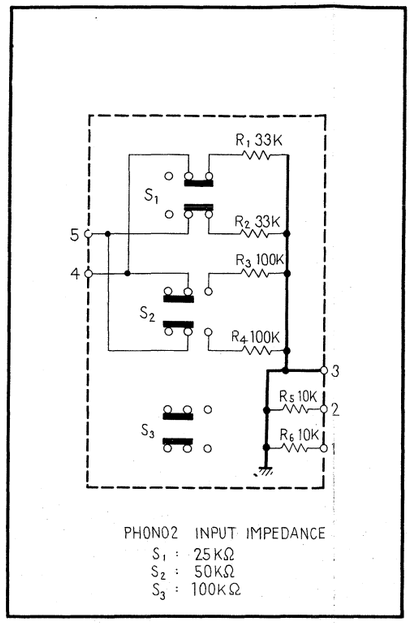
COILS

Symbol	Description		Part No.	
L1	Choke coil	104k	ATM-012-0	
L2	Choke coil	104k	ATM-012-0	

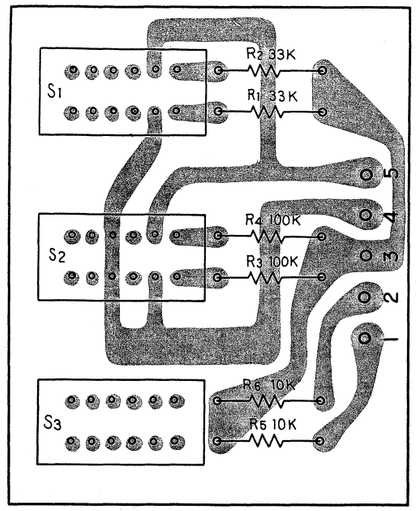
SWITCH

Symbol	Description	Part No.	
S1	Lever switch (HIGH FILTER)	ASK-076-0	
S2	Lever switch (LOW FILTER)	ASK-076-0	
S3	Lever switch (TONE)	ASK-074-0	
S4	Lever switch (OUTPUT)	ASK-073-0	

12.13 SWITCH CIRCUIT-4 ASSEMBLY (AWS-058-0)



(AWS-058-0)



Foil side

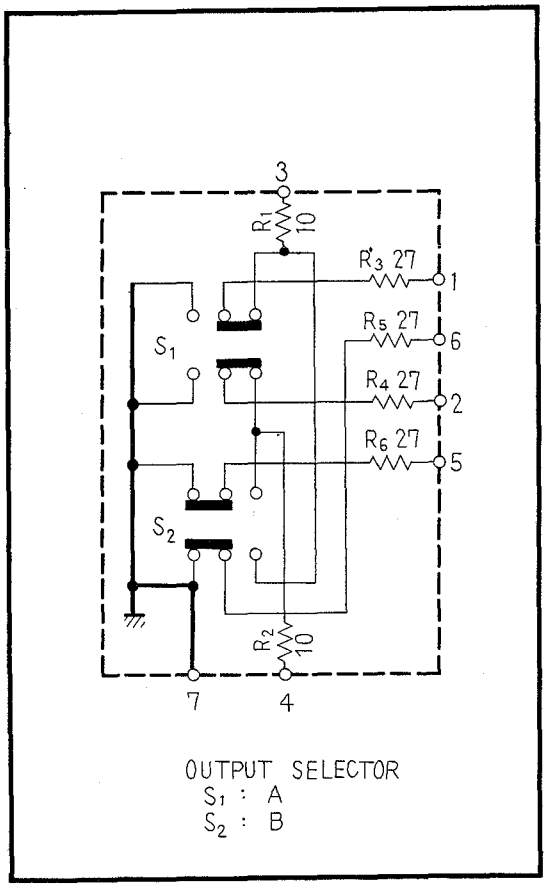
RESISTORS

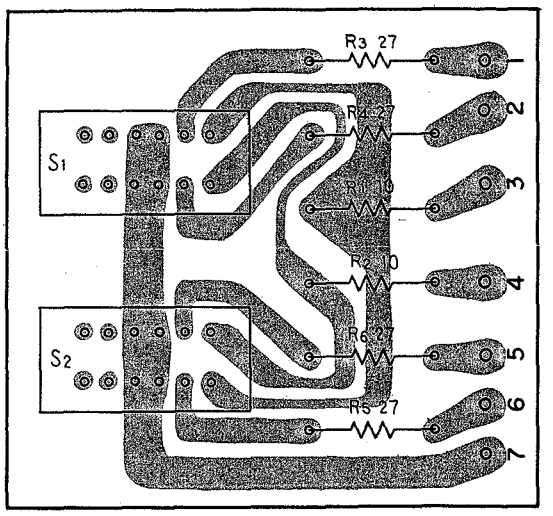
Symbol	Description		Part No.	
R1	Carbon film	33k	RD¼PS 333JNL	
R2	Carbon film	33k	RD¼PS 333JNL	
R3	Carbon film	100k	RD¼PS 104JNL	
R4	Carbon film	100k	RD¼PS 104JNL	
R5	Carbon film	10k	RD¼PS 103JNL	
R6	Carbon film	10k	RD¼PS 103JNL	

SWITCHES

Symbol	Description	Part No.	
S1	Push switch (PHONO 2 INPUT IMPEDANCE)	ASG-053-0	
S2	Push switch (PHONO 2 INPUT IMPEDANCE)	ASG-053-0	
S3	Push switch (PHONO 2 INPUT IMPEDANCE)	ASG-053-0	

12.14 SWITCH CIRCUIT-5 ASSEMBLY (AWS-059-0)





Foil side (AWS-059-0)

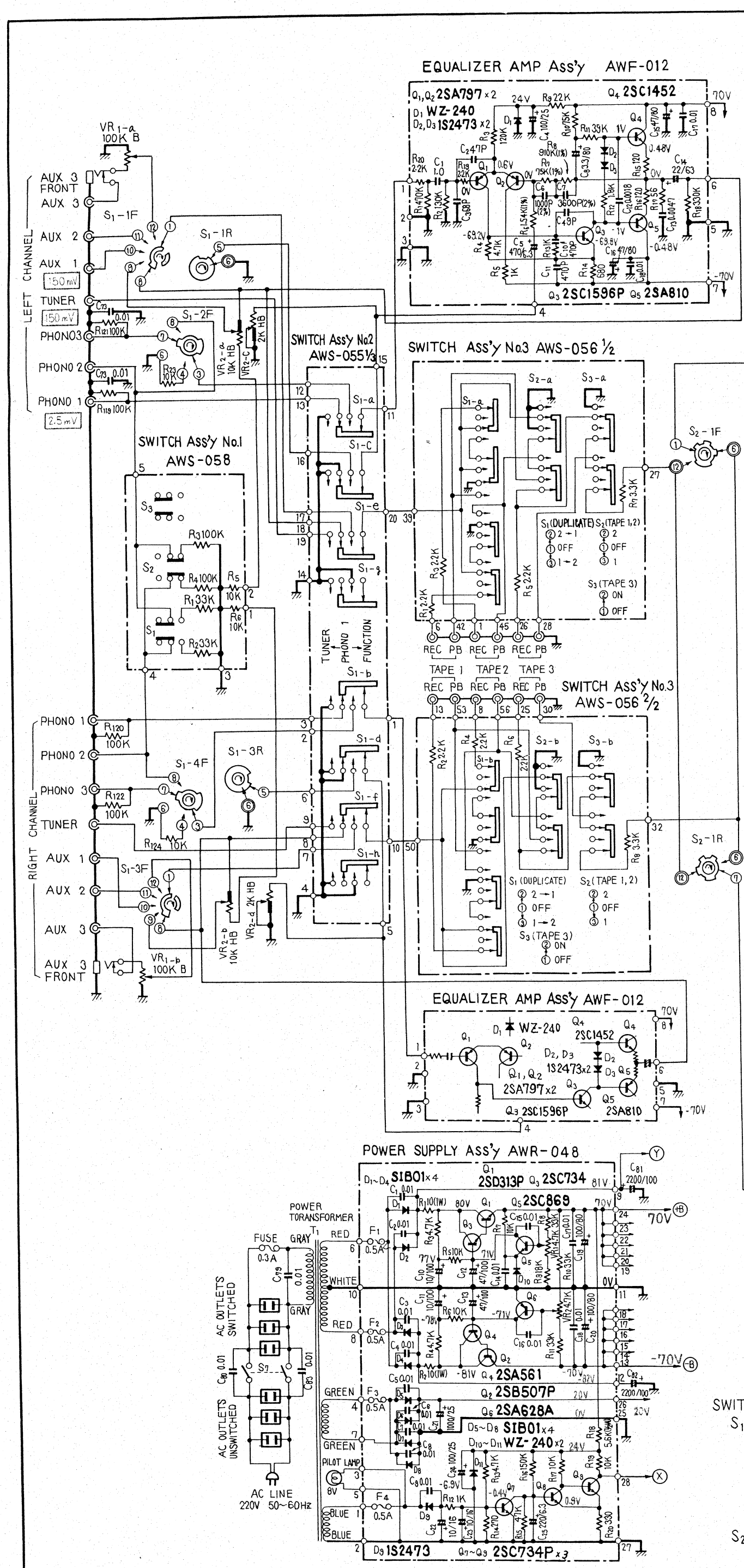
RESISTORS

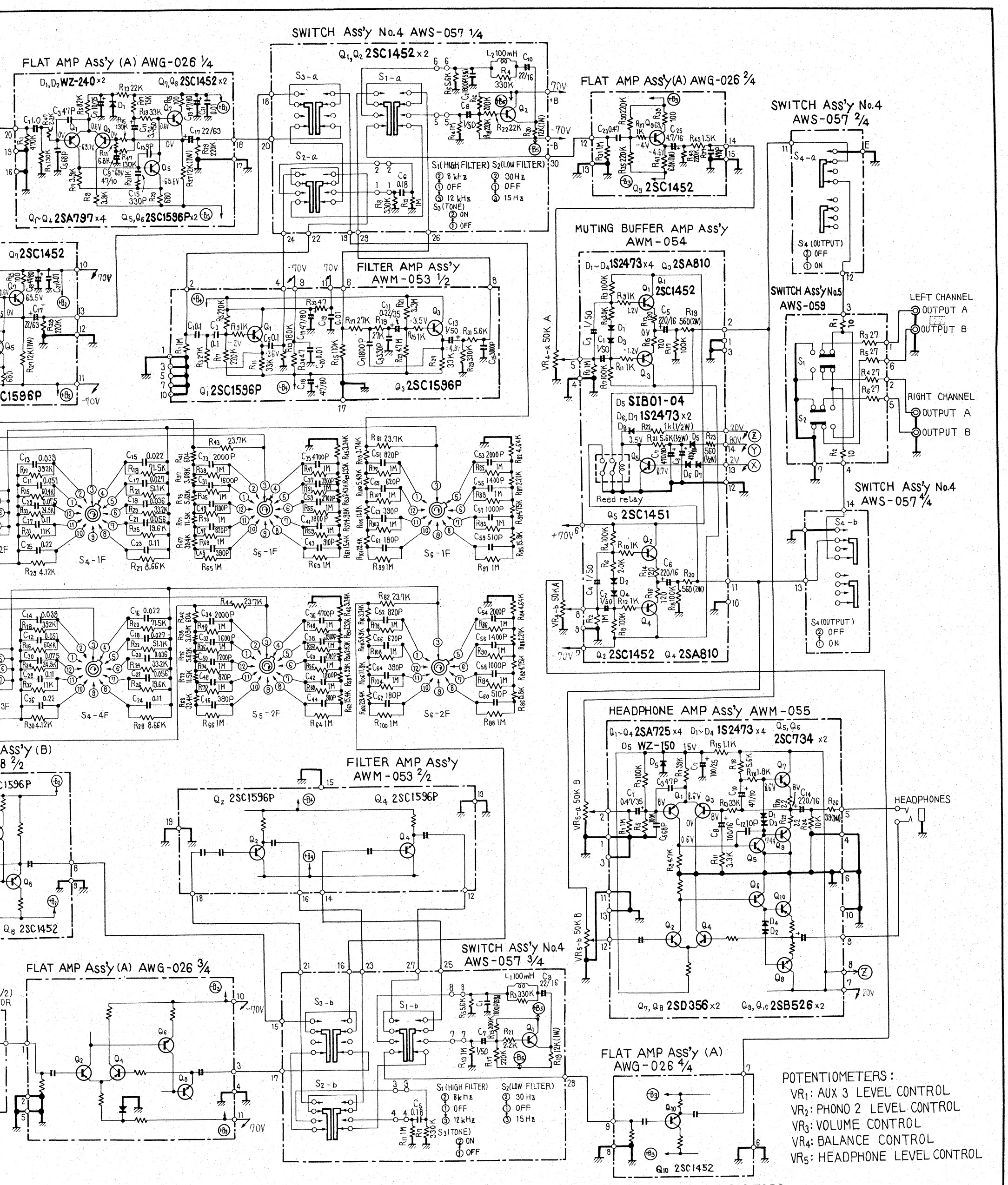
Symbol	Description	Part No.	
R1	Carbon film 10	RD¼PS 100JNL	
R2	Carbon film 10	RD¼PS 100JNL	
R3	Carbon film 27	RD¼PS 270JNL	
R4	Carbon film 27	RD¼PS 270JNL	
R5	Carbon film 27	RD¼PS 270JNL	
R6	Carbon film 27	RD¼PS 270JNL	

SWITCHES

Symbol	Description	Part No.	
S1	Push switch (OUTPUT)	ASG-052-0	
S2	Push switch (OUTPUT)	ASG-052-0	

PIONEER EXCLUSIVE C3 N





S6 : TREBLE (SUB)
-6 ~ +6dB (1.5dB step)

S7 : POWER
ON ⟷ OFF

SWITCH Ass'y No.1
PHONO 2 INPUT IMPEDANCE
S1 : 25KΩ S2 : 50KΩ S3 : 100KΩ

SWITCH Ass'y No.2
S1 : SELECTOR
TUNER
PHONO 1
FUNCTION

S2 : ATTENUATOR
0
-15 dB
-30 dB

SWITCH Ass'y No.3
S1 : DUPLICATE
1 → 2
OFF
2 ← 1

S2 : TAPE MONITOR
1
OFF
2

S3 : TAPE MONITOR 3
OFF ⟷ ON

SWITCH Ass'y No.4
S1 : HIGH FILTER
12 kHz
OFF
8kHz

S2 : LOW FILTER
15Hz
OFF
30Hz

S3 : TONE
OFF ⟷ ON

S4 : OUTPUT
ON ⟷ OFF

SWITCH Ass'y No.5
OUTPUT
S1 : A ⟷ S2 : B

CAPACITORS:
IN μF UNLESS OTHERWISE NOTED. P : pF

RESISTORS:
IN OHM, 1/4W, ±5% TOLERANCE UNLESS OTHERWISE NOTED. K : kΩ M : MΩ

NOTES :
[V] : SIGNAL VOLTAGE NECESSARY FOR OBTAINING 2V OUTPUT (1 kHz).
V : DC VOLTAGE AT NO INPUT SIGNAL.
⇦ A : DC CURRENT AT NO INPUT SIGNAL.